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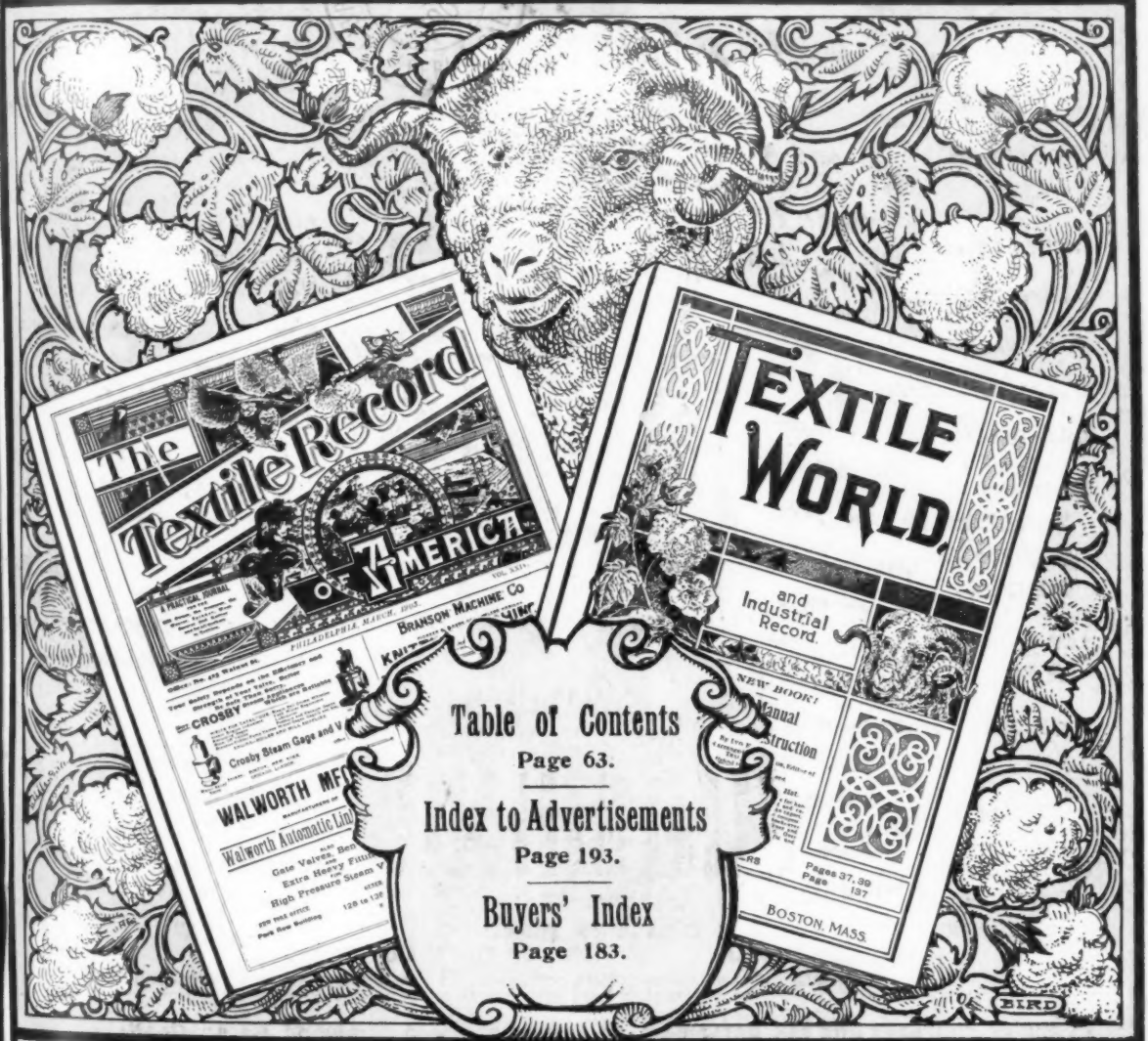
TEXTILE WORLD RECORD



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The Annual Official Directory of the Textile Industries for 1904 is now ready for prompt delivery.

The Textile-Finishing Machinery Co.

17 EXCHANGE PLACE, PROVIDENCE, R. I.

Mercerizing Machinery for Piece Goods and Yarn in the warp or chain

Singeing Machines,

Boiling Kiers,

Washers, Squeezers,

Chemic and Sour

Rusden Patent

Continuous Chainless

Steamer,

Aniline Agers,

Dyeing Machines,

Open Soapers,

Blanket Washers,

Color Kettles,

Horizontal or Vertical Drying Machines, with Copper or Tinned Iron Cylinders,

Automatic Tentering Machines,

Water and Starch Mangles,

Dampening Machines,

Dyeing Machines for Chain Warps.

BUILDERS OF ALL KINDS OF

MACHINERY

FOR

BLEACHING

DYEING

DRYING

AND

FINISHING

Calenders for Rolling, Glazing, Chasing and Embossing, also Calenders for Moire Finish.

Patent Combination Rolls made of Cotton and Husk especially adapted for Soft Finish, Unequalled for Elasticity and Durability.

Cotton, Paper, Husk, Chilled Iron, Brass and Rubber Rolls, Electro-deposited Copper Rolls for all Purposes.

Padding and Drying Machines for Shade Cloths.

Single and Double Cylinder Engines.

Hydraulic Presses and Pumps.

ALL KINDS OF OUTFITS FOR BLEACHING THREAD AND SOFT TWISTED YARN.
BLEACHING MACHINERY FOR YARNS IN THE WARP OR CHAIN.

Estimates, drawings and full particulars of complete plants furnished on application

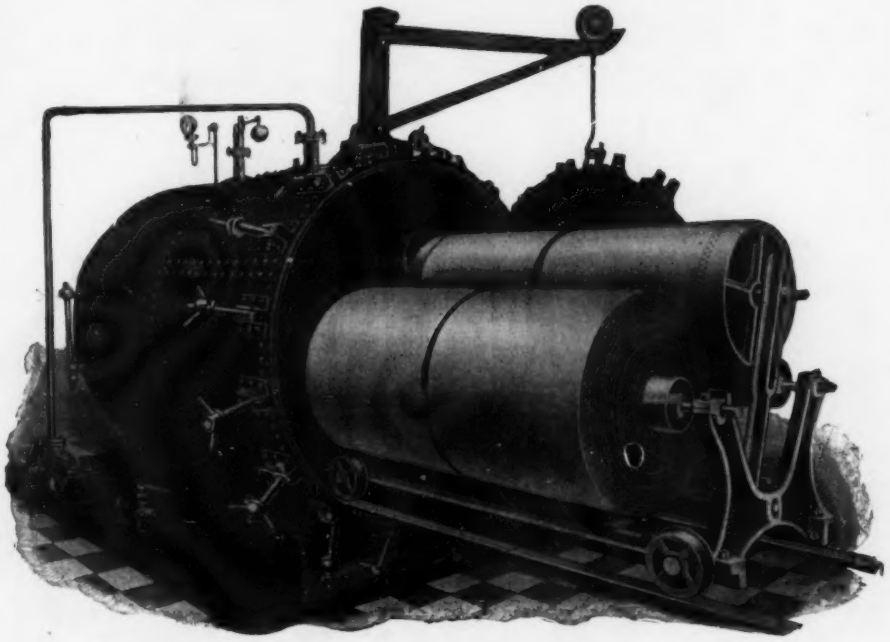
Southern Agent, STUART W. CRAMER, Trust Bldg., Charlotte, N. C., Equitable Bldg., Atlanta, Ga.

Open Bleaching System

OF

JACKSON & HUNT

Patented in the United States, Great Britain and the Continent
U. S. Patent, January 15th, 1901. No. 666,056



H. W. Butterworth & Sons Co.

Manufacturers of

Bleaching, Dyeing, Drying and Finishing Machinery

YORK AND CEDAR STREETS

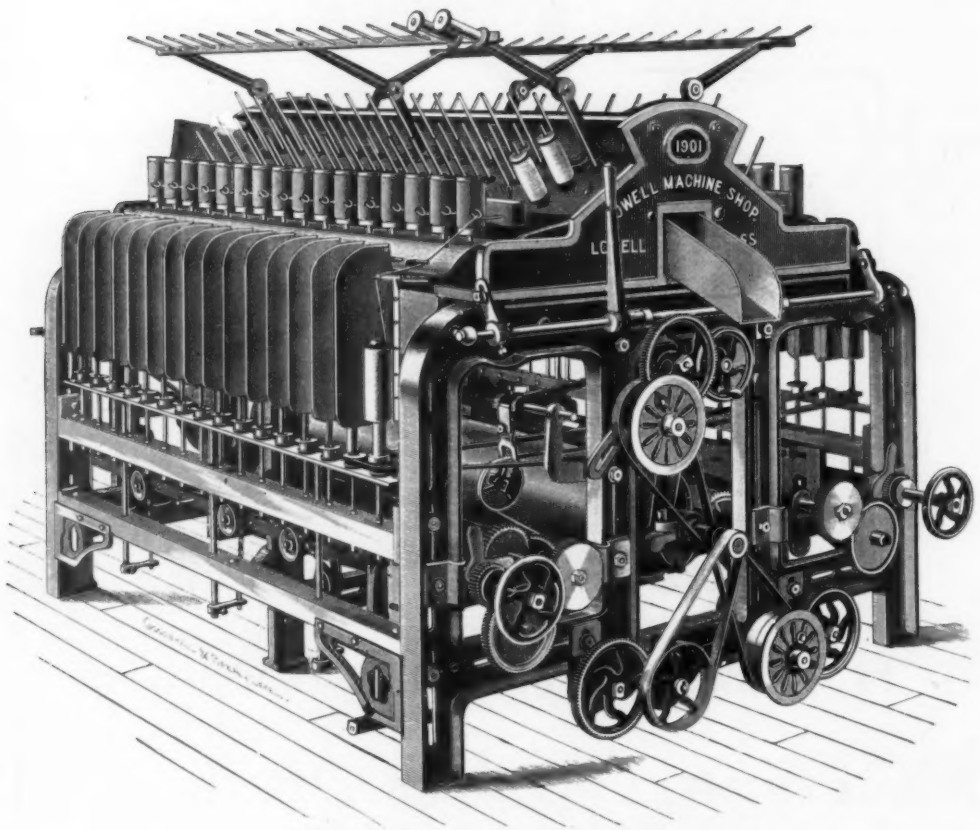
PHILADELPHIA

Sole Makers for the United States

Worsted Machinery

Made in the

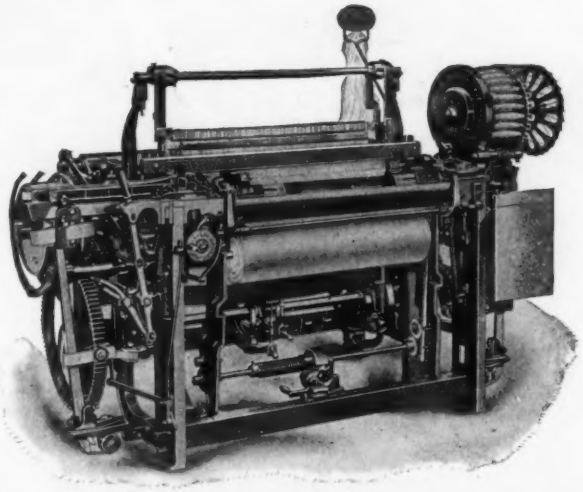
United States



Worsted Cap Trap Twister

Lowell Machine Shop

Lowell, Mass.



THE J MODEL LOOM

DESIGNED exclusively for Print Cloths and similar light fabrics. Will weave without a thick or a thin place. Can bang off without shock. Has the large hopper, the Draper-Roper let-off, a new take-up and a new warp stop knock-off.

Large orders now being filled by the

DRAPER COMPANY,

Hopedale, Mass.

OUR LATEST!

AUTOMATIC FILLING STOP MOTION

This attachment will positively stop the loom just before filling runs out, leaving absolutely no mispicks, and it can be attached to any loom.

It can be seen in operation at our works, where we have also on exhibition our

Automatic Shuttle Changing Device.

THE ASALA COMPANY.

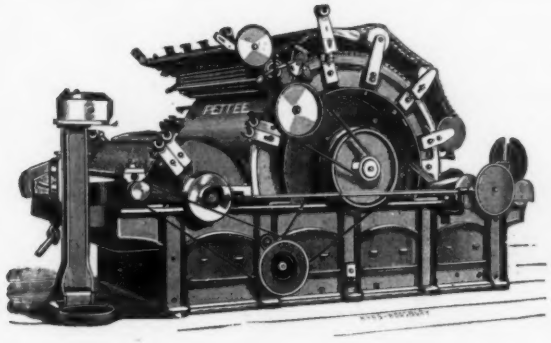
Works:
Slatington, Pa.

New York Office:
415 Broadway.

Saco and Pettee Machine Shops

NEWTON UPPER FALLS, MASS., U. S. A.

COTTON MACHINERY



PICKERS,
REVOLVING FLAT CARDS,
DRAWING FRAMES,
RAILWAY HEADS,

SLUBBING,
INTERMEDIATE AND ROVING FRAMES,
SPINNING FRAMES,

SPOOLERS AND REELS.

Shops: { **Biddeford, Me.**
Newton Upper Falls, Mass.

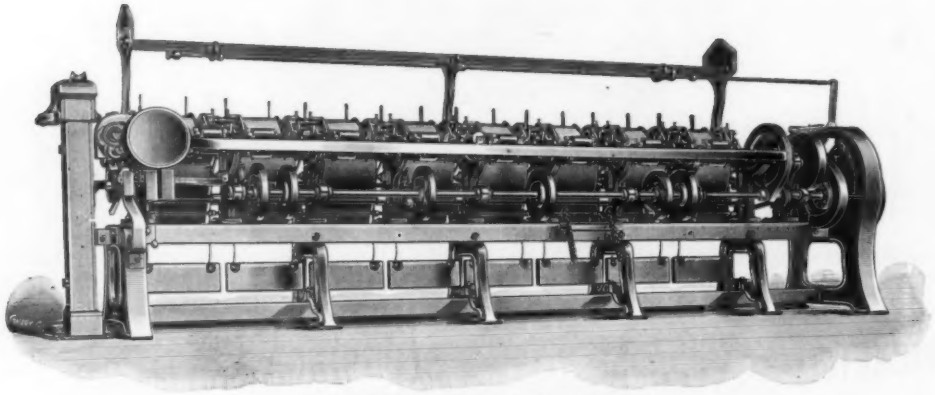
Southern Agent, A. H. WASHBURN, Charlotte, N. C.

THE

WHITIN MACHINE WORKS,

Cotton Machinery

WHITINSVILLE, MASS.



The Whitin 8 Head Comber.

Southern Agent, . . . S. W. CRAMER

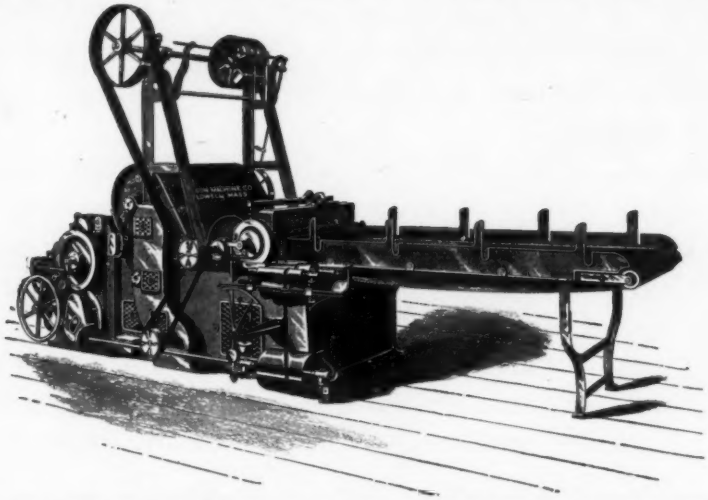
Trust Building, CHARLOTTE, N. C.
and Equitable Bldg, ATLANTA, GA.

Revolving Flat Carding Engines,
Sliver Lap Machines,
Ribbon Lap Machines,
Combers,
Railway Heads,
Drawing Frames,

Spinning Frames,
Spoolers,
Twisters,
Reels,
Looms,
Long Chain Quilling Machines.

The Best Pickers

In the Cotton Field nothing equals the DARKY COTTON PICKERS.



In the Cotton Mill nothing equals the KITSON COTTON PICKERS.

KITSON MACHINE CO., LOWELL, MASS.

LARGEST BUILDERS OF COTTON OPENERS AND LAPPERS IN THE WORLD.

STUART W. CRAMER, Southern Agt., Charlotte, N. C. and Equitable Bldg., Atlanta, Ga.

SCOTT & WILLIAMS

BUILDERS OF

RIB KNITTING MACHINERY

For Underwear and Hosiery.

PHILADELPHIA, June 22, 1904.

The Homer P. Snyder Mfg. Company and its sales manager, Wm. A. Ainsworth (who formerly represented us) announce to the trade that they are offering for sale knitting machines "very similar to the machines sold by him for so many years," that is, "very similar" to the Scott & Williams machines. We believe these Snyder machines are so "very similar" to our machines that they are direct infringements upon a number of our patents.

We have accordingly brought suit in the United States Circuit Court against the Homer P. Snyder Mfg. Company and its sales manager, Wm. A. Ainsworth, for injunction and damages for infringement of our knitting machine patents No. 368,429, No. 421,147 and No. 681,161, and we shall prosecute the case vigorously.

Manufacturers of knit goods are hereby cautioned against the use of infringing machines and are notified that the purchase and use by them of said machines renders them liable to suit for injunction and damages.

SCOTT & WILLIAMS,

2079 E. Cumberland Street, Philadelphia, Pa., U. S. A.

BRANSON MACHINE CO.

BUILDERS OF

KNITTING MACHINERY

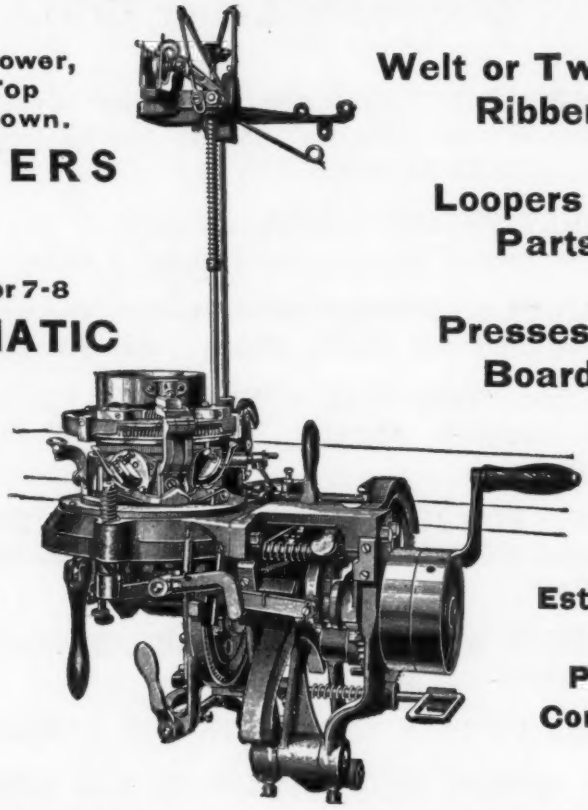
Hand or Power, Open Top or Hold Down.

KNITTERS

1-2, 3-4 or 7-8

AUTOMATIC KNIT-TERS

All Sizes and All Cauges.



Welt or Two-Feed Ribbers.

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Estimates for Plants Complete.

Winders and Bobbins.

Hand Forged Steel Cylinders.

BRANSON MACHINE CO.

504 North American Street, : : Philadelphia, Pa.

Write for Information and Catalogue.

HARWOOD'S MACHINERY

Increases Production,
Improves Quality,
Decreases Labor Cost.

THE BRAMWELL FEEDER (over 12,000 now in use.)
For Woolen, Worsted, Shoddy and Hosiery CARDS and GARNETT Machines.

THE APPERLY FEEDER (over 15,000 in use.)
For Second Breaker and Finisher CARDS.

THE BRAMWELL PICKER FEEDERS (two styles.)
For Burr and Mixing Pickers, also Fearnaughts.

THE NEW 1902 BRAMWELL OPENER AND FEEDER,
A Complete Machine. For Wool Washers and Wool Dryers.

SOLE AGENTS FOR THE SPENCER AUTOMATIC STOCK OILER,
Send for Sheet of Testimonials. Saves Oil, Labor and Waste.

A NEW CLUTCH ATTACHMENT FOR BRAMWELL FEEDERS,
Positive and Durable.

A FULL LINE OF PINS AND PARTS FOR LAMAIRE FEEDS.

IMPROVED APRONS AND REPAIRS OF ALL KINDS.

GEO. S. HARWOOD & SON,
53 State Street, Room 703,
BOSTON, MASS.

Long Distance Telephone, 3212 (Main) Boston.

EVAN ARTHUR LEIGH

232 Summer Street (opposite the South Station), Boston, Mass.

SOLE AGENT IN THE UNITED STATES AND CANADA FOR

Platt Bros. & Co., Ltd.

BY FAR THE LARGEST MAKERS IN THE WORLD OF

Cotton, Woolen and Worsted Machinery

Platt Bros. & Co. are exhibiting in the Varied Industries Building, Louisiana Purchase Exhibition, St. Louis, Mo., the most complete line of Cotton Machinery that has yet been exhibited, for spinning from coarse counts up to 300's.

MATHER & PLATT, LTD.

Dyeing and Finishing Machinery. Archbutt-Deeley System for purifying and softening water.

TEXTILE MACHINERY ASSOCIATION, LTD.

Flax, Hemp and Jute Machinery.

THE PATENT AUTOMATIC FEEDING MACH. CO., LTD.

Patent Feeding Machines for wool, cotton, flax, fur and fibrous material.

GEORGE HODGSON, LTD.

Looms for Worsteds, etc.

JOSEPH SYKES BROS., Card Clothing for Cotton.

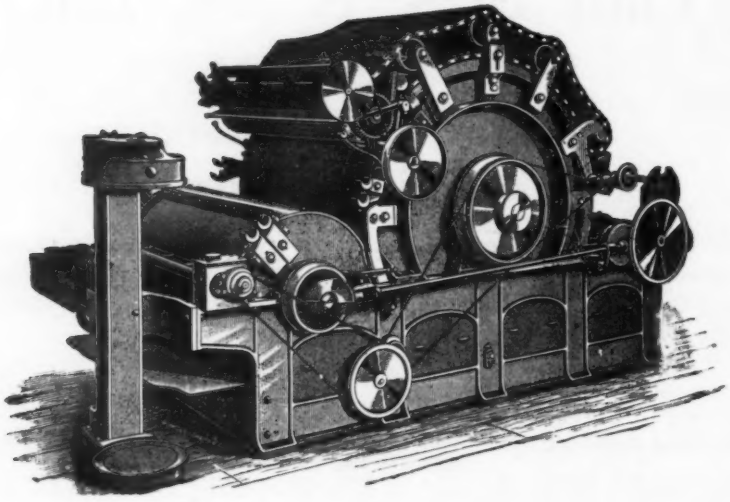
JAMES CRITCHLEY & SON'S, Card Clothing for Woolen and Worsted.

DRONSFIELD BROS'. Grinding Machinery and Emery Filleting.
The best French and English Combing and Rubbing Aprons.
Harding's Pins and Circles, Varey's Fallers, etc.

MASON MACHINE WORKS,

TAUNTON, MASS.

Cotton Machinery



Cards, Combers, Railway Heads, Drawing Frames, Spinning Frames, Mules and Looms,

INCLUDING

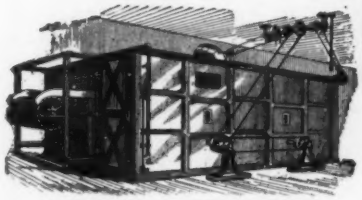
Plain and Fancy Silk Looms

Southern Office, Charlotte, S. C.

"HURRICANE" DRYERS AND FANS

For WOOL, COTTON STOCK, YARN, STOCKINGS, UNDERWEAR, Etc.

Write for Booklets.



Cotton Stock and Wool Dryer.

Truck Yarn Dryer.

MACHINERY FOR **BLEACHING** AND **CARBONIZING.**

"Hurricane" Fan, Style No. 2.

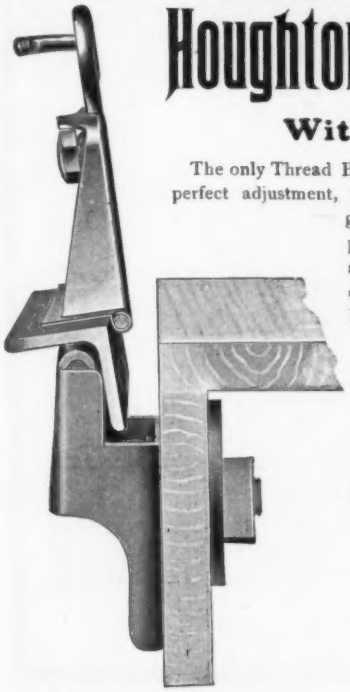
SPECIAL MACHINERY OF EVERY DESCRIPTION DESIGNED AND BUILT.

PHILADELPHIA DRYING MACHINERY CO.

6721 Germantown Ave., Philadelphia, Pa.

Houghton's All Steel Thread Board

With Hardened Thread Guides.



The only Thread Board that *holds a guide solid* all the time; *never* gets loose; is always in perfect adjustment, and thus must make a saving in travelers, broken ends, waste, thread guide, care and also prolong the wear of rings and increase the production per spindle. These claims are based on the truth of mechanical principles and have been proven true by actual use in many mills, whose superintendents will substantiate these claims. Write for list of mills using our Thread Boards.

PRICE.

Steel Thread Boards, 7½c. per Spindle
Brass Thread Boards, 15c. per Spindle
f. o. b. Worcester.
Add 3c. each for Metal Rail.

1,000,000 Already in Use.

Thousands of wooden thread boards thrown aside and replaced with my Steel Boards because they pay for themselves annually,

PATENTED.

Nov. 30, . .	1897	Nov. 9, . .	1901
Mar. 8, . .	1898	June 9, . .	1903
July 1, . .	1901	Mar. 1, . .	1904
		May 9, . .	1904

and other patents pending.

Any infringements of the above Patents will be prosecuted.

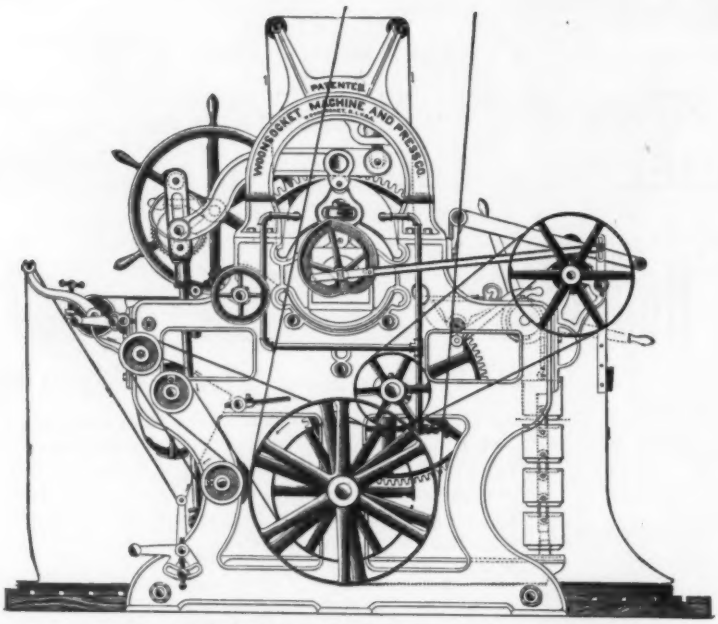
L. T. Houghton, Sole Manufacturer, Worcester, Mass.

Best Patent Steam Rotary Cloth Press

Four Separate Pressings In One Machine!

The Only Press that has Self-Yielding Beds with Four Points of Contact

PERFECT TEMPERATURE, POWERFUL, SIMPLE



THE WOONSOCKET ROTARY PRESS.

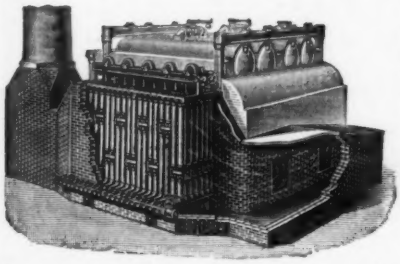
Woonsocket Machine and Press Company

WOONSOCKET, R. I,

THOUGHTFUL CONSIDERATION

on the part of the Engineer, makes great economies in the running of a Plant, particularly if assisted by a

Green's Economizer



which is the greatest assistant to true economy yet produced. The gain in steam, with the corresponding reduction of fuel, seems incredible, but with our Economizer you can easily save from 10 to 20% in Fuel, and yet, through the use of waste gasses entirely, keep the feed-water heated above the boiling point. What this means to the **Textile Mill, Bleacheries** and **Dyehouses,** is best ascertained through the testimonials of those having one in their boiler room. Our booklet, sent free, shows not only how it is done, but gives you a list of users, and their testimonies as to the value to them. Our great advantage—applied without stoppage to works Write us for plans and specifications.

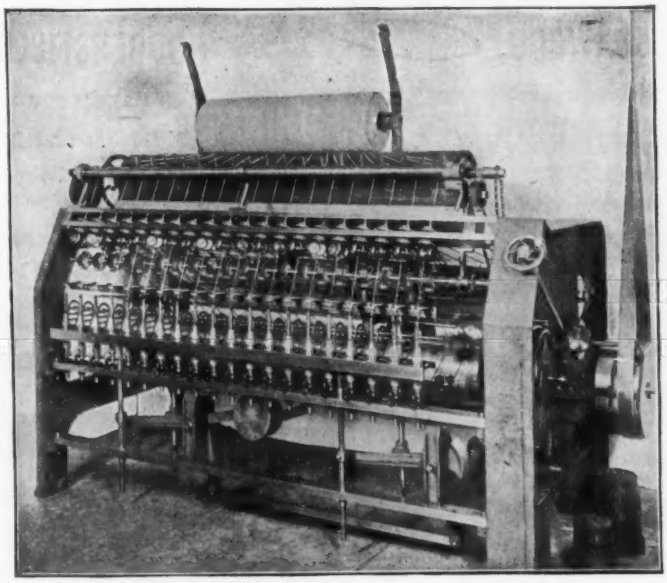
THE GREEN FUEL ECONOMIZER CO.,

Sole Manufacturers in the U. S. A. **Matteawan, N. Y.**

A NEW WOOL SPINNING FRAME

On Exhibition at the Bourse, Philadelphia.

Patented in Europe and America.



Adapted to Spinning Mixed Fibres of any Description.

ADDRESS ALL COMMUNICATIONS FOR THE PRESENT TO

C. L. FLACCUS, 224 NO. THIRD ST., PHILADELPHIA, PA.

THE

A. T. ATHERTON MACHINE CO.

PAWTUCKET, R. I.

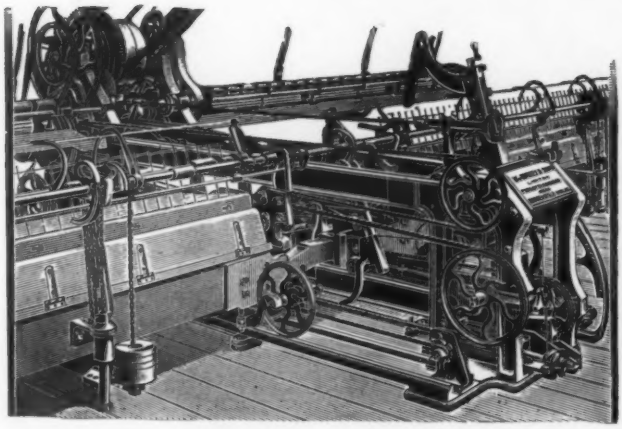
The Leading Manufacturers of

PREPARATORY COTTON MACHINERY

Telegraphic Address: "WHITELEY, HUDDERSFIELD." Nat. Telephone, 598 and 599.

Wm Whiteley & Sons Ltd.

LOCKWOOD, HUDDERSFIELD.



SELF-ACTING MULE.

Makers of all descriptions of

Tentering and Drying Machines.

Moore & Whiteley's Patent Wool and Cotton Dryer.

Crabbing or Winding-on Frames.

Cross Raising Machines, Wool Scouring Machines.

Hydro Extractors. Warp Sizing.

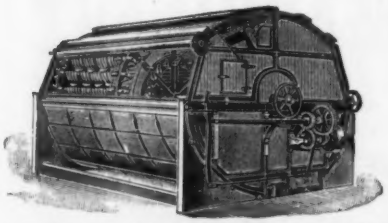
Cool Air Drying and Beaming Machines.

Warping Mills with Patent Sectional Dividing Apparatus.

Self-Acting Mules. Bobbin or Pirn Winder, &c., &c.

Mercerizing Machinery.

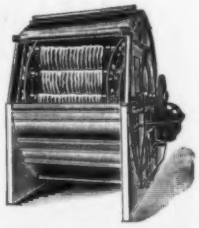
SKEIN AND SLUBBING MACHINES



SAVES

75% in Labor.
30% in Winding.
Steam and Dye Stuffs.
No Friction.
No Tangling.

CAPACITY
50 to 700 lbs per batch.



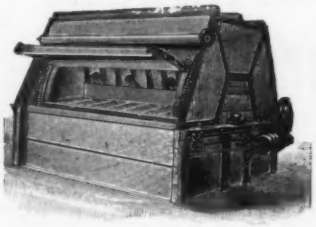
THE KLAUDER-WELDON DYEING MACHINE CO.

AMSTERDAM, N. Y.

Builders of Machines

For Skein—Worsted, Slubbing, Cotton and Silk.
" " and Warp Mercerizing.
" Raw Stock Cotton, Wool, Waste and Rags.
" Garments Underwear, Hosiery and Caps
" Sulphur Colors—Raw Stock, Skein and Hosiery.

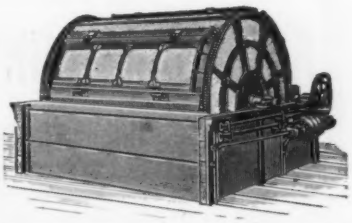
RAW WOOL AND COTTON MACHINES.



CAPACITY
200 to 1000 lbs per batch.

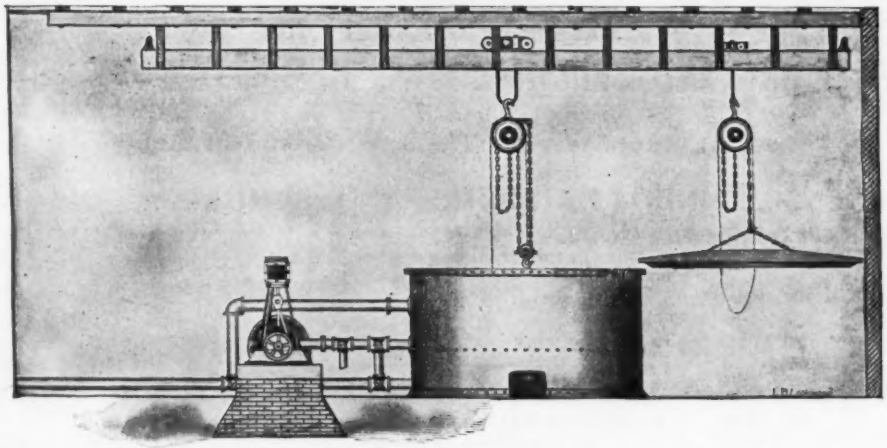
SAVES

50% in Labor besides Steam and Dye Stuffs. Practically indestructible. Leaves stock in perfect condition.



VACUUM DYEING MACHINE CO., CHATTANOOGA, TENN.

RAW STOCK, YARN AND HOSIERY DYEING MACHINES



OFFICE OF TREMONT & SUFFOLK MILLS, LOWELL, MASS., Jan. 14, 1904.

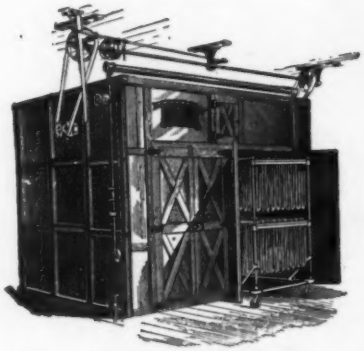
VACUUM DYEING MACHINE CO., Chattanooga, Tenn.

GENTLEMEN: Replying to your inquiry in regard to what we think of your Raw Stock Dyeing Machine, would state that we have been using one about six months, with very satisfactory results, the dyeing being level, and the stock left in first-class condition for spinning. Can give your machine no better recommendation than to say, we think so well of it that we have just placed an order for two additional machines.

Yours truly J. J. CONNELL, Agent.

"20th CENTURY" MACHINERY

DRYERS
for
WOOL,
COTTON STOCK,
YARN, STOCKINGS,
UNDERWEAR.
VENTILATING FANS.
MACHINERY
for
CARBONIZING
and
YARN SCOURING.



TRUCK YARN DRYER.

CLOTH WASHERS
and
CLOTH DYEING MACHINES, BLEACHING MACHINERY FOR KNIT GOODS, ETC.
CONTINUOUS SYSTEM
FOR BLEACHING COTTON STOCK.
TOM-TOMS,
CHROMING, WASHING
and
OXIDIZING MACHINES.

AMERICAN DRYING MACHINERY COMPANY,

19th AND WESTMORLAND STS., PHILADELPHIA, PA.

Fairbairn Lawson Combe Barbour, Ltd.

LAWSON BRANCH,

Hope Foundry. **LEEDS.** **England.**

MAKERS OF MACHINERY FOR

PREPARING AND SPINNING FLAX, HEMP, TOW AND JUTE

AND OF

Special Machinery for the Manufacture of Twines,

ALSO OF

GOOD'S COMBINED HACKLING AND SPREADING MACHINE,

LONG REACH SCREW-GILL DRAWING FRAMES,

CHAIN-GILL DRAWING FRAMES with Apron Head,

PATENT HIGH-SPEED HORIZONTAL AND AUTOMATIC SPINNING FRAMES FOR MANILLA,

AND OTHER

Special Machinery for the manufacture of Rope Yarns and Binder Twine.

IMPROVED LAYING MACHINES. HASKELL-DAWES TUBING TWISTERS

BROWNELL'S PATENT TWISTING AND LAYING MACHINES FOR TWINE.

Complete Plans and Estimates for Flax, Tow, Hemp and Jute Mills, Trawl Twine Factories and Steam Ropeworks.

BUILT ON THE RIGHT PRINCIPLE

We have devoted years to the study of exhaust heads and have found the right principles, all of which are embodied in

The Burt Exhaust Head

Indisputably the world's standard. It allows only absolutely dry steam to escape through the exhaust pipe. It will save you many dollars in repair bills for damaged roofs and walls from moisture, dripping and spraying water and oil that comes from the exhaust pipe.
Send your order today with size of pipe; dissatisfied, return.

"We are charmed with the efficiency of the Burt Exhaust Head."
—N. Ludington Co., Marinette, Wis.

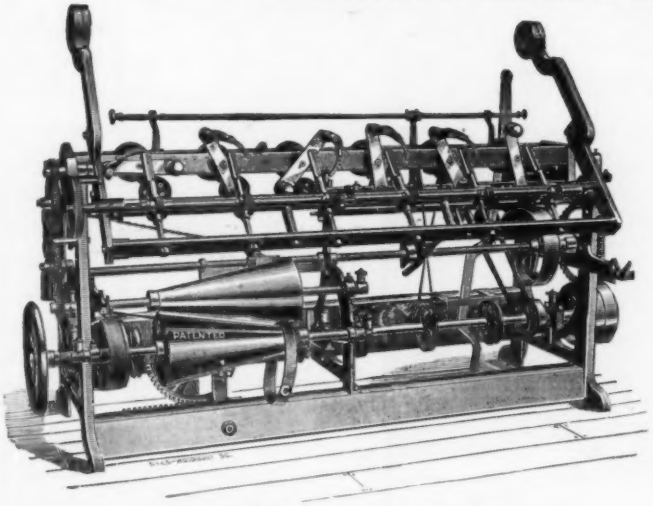
The BURT MFG. CO. LARGEST MANUFACTURERS OF OIL FILTERS IN THE WORLD.

214 Main St., AKRON, OHIO, U. S. A.

SUPPLIED ALSO BY ENGINE BUILDERS, DEALERS AND POWER CONTRACTORS.

NORTH CHELMSFORD MACH. CO.

Successors to SILVER & CAY CO.



AUTOMATIC BALL WINDER.
Adapted to All Kinds of Twines, Silks and Floss.

MANUFACTURERS OF
Automatic
BALL WINDERS.

QUILLERS & REELS.

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No connection with any other concern. Our only place of business for 15 years is at **SOMERVILLE, MASS.,** to which place please address your enquiries.

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SOMERVILLE MACHINE WORKS,

WOOLEN and WORSTED FINISHING MACHINERY

And also for

BLEACHING, DYEING, DRYING and FINISHING COTTON GOODS.

FRENCH NAPPING MACHINES.

SEND FOR CIRCULARS AND PRICES.

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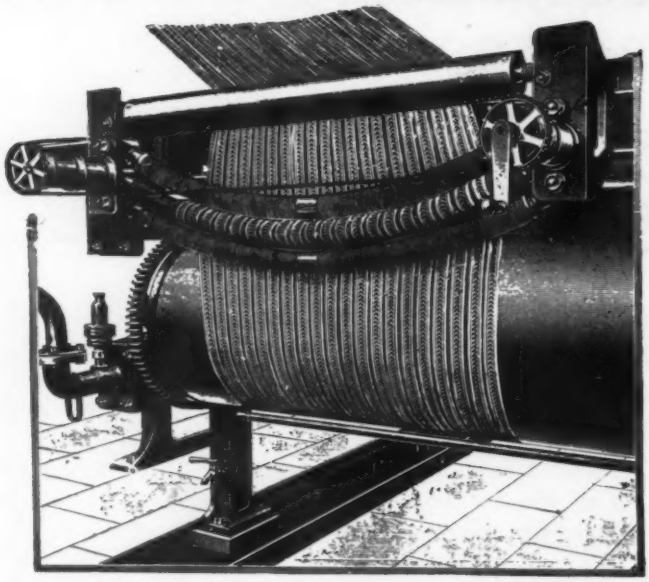
A PERFECT CLOTH EXPANDER



The recent invention of Wm. Mycock, an English cotton manufacturer. Hundreds sold in Great Britian and on the Continent. Large bleacheries in this country where it has been placed on trial are delighted with it. Gets the full width of goods, with perfectly even tension both ways. Can be attached to calenders or cans. Put it on trial.

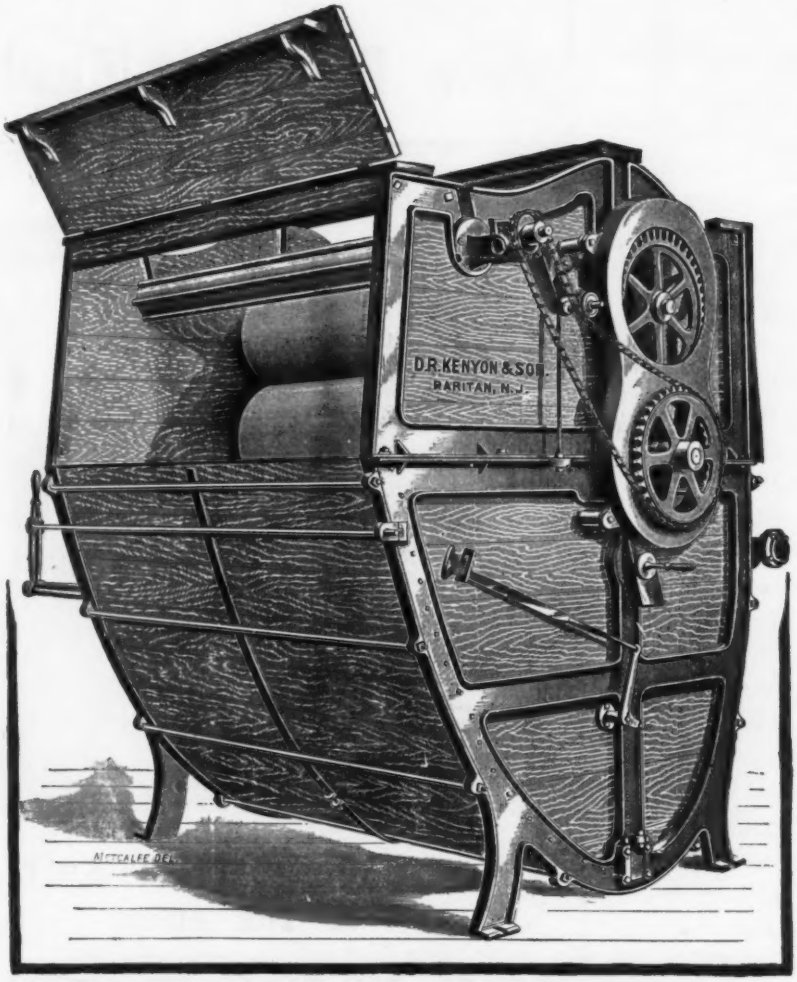
Patented in United States, Canada, Great Britain and Continental countries. Infringements will be prosecuted.

THOMAS LEYLAND & CO., 53 INDIA ST., BOSTON.

Sole Agents for the United States and Canada.

Kenyon's Improved Cloth Washer

FOR FOUR, SIX OR EIGHT STRINGS OF GOODS



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Improved trough and valves, preventing wash of liquor and insuring quick and thorough scouring and rinsing.

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BUILDERS OF WOOLEN MACHINERY

RODNEY HUNT MACHINE COMPANY

WATER WHEELS,
Horizontal and Vertical.
Iron Flumes and Penstocks.
Rotary Fire Pumps.
Centrifugal Pumps.
Head Gate Apparatus.
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Rotary Fulling Mills.
Rotary Cloth Washers.
Rotary Knit Goods Washers.
Combined R'y Fulling Mill
and Washer for Knit Goods.
Endless Felt R'y Washers
and Rotary Felling Mills.
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Dolly Washers.
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Crank Knit Goods Washers.
Wringing and Rinsing Mchs.
Reel Dyeing Machines.
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Chloride of Lime and
Peroxide of Sodium,
Dye Tubs and Rinsers.
Wool Washers.
Soaping Machines.
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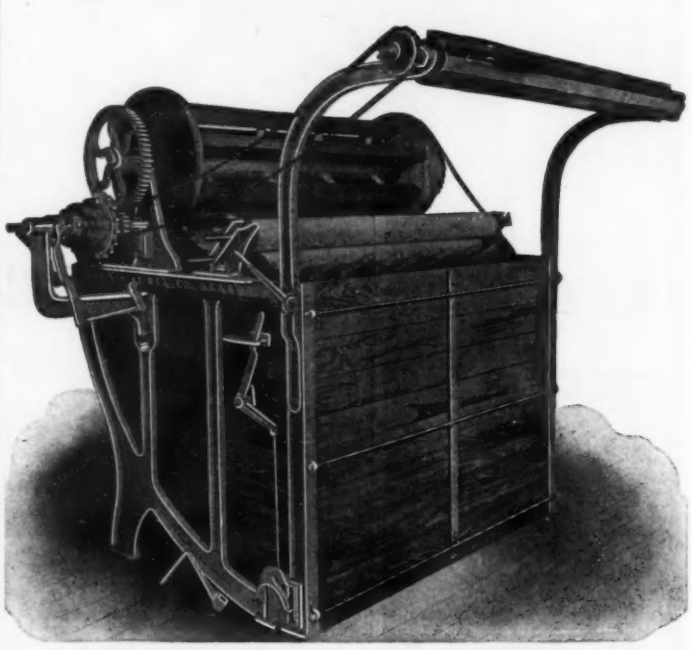
New Dyeing Machine



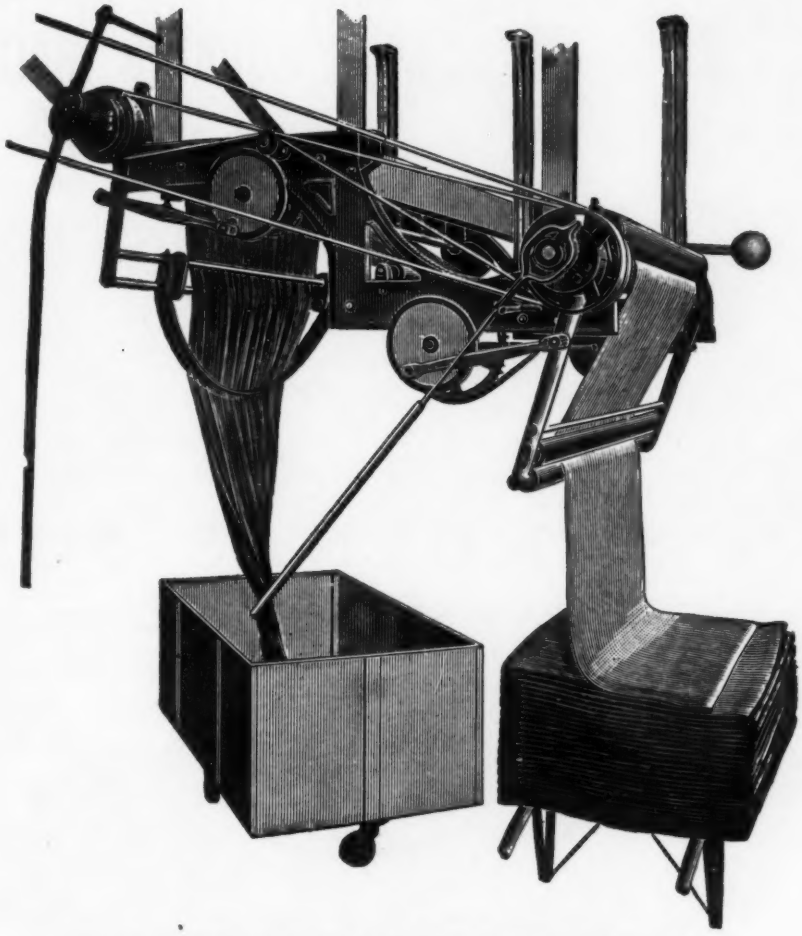
TYPE L. FOR CLOTH AND KNIT GOODS IN THE PIECE.

TYPE M. FOR BLEACHING COTTON KNIT GOODS, CIRCULAR No. 16.

Boston Office,
70 KILBY STREET,
Telephone No. 1522.

Main Office and Works,
ORANGE, MASS.

The Hunter CLOTH OPENER AND FOLDER



ONE MAN CAN OPEN AND FOLD MORE GOODS IN A DAY WITH THIS MACHINE THAN FOUR MEN CAN DO BY HAND.

No stretching or beating of goods under tension. All the parts coming in contact with cloth are brass or wood.

Opens any width of cloth from 63 inches down to 30 inches. Can be built wider for blankets.

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YOU WANT THE BEST. WE BUILD THEM.

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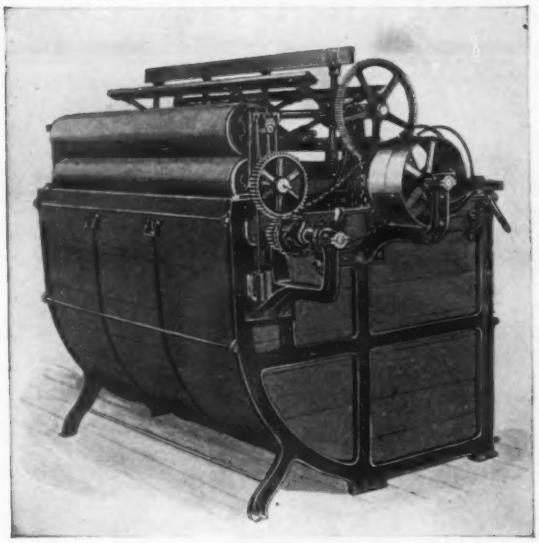

1903 PIECE DYEING MACHINE.

FULLING MILLS

Piece Dyeing Machines,
Dye Tubs, Vats,
Tanks, etc.

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Patented features found in no others.
Most effective and economical machines built.

Send for Catalog, Prices, and also ask about our fulling mill for extra heavy goods and blankets.

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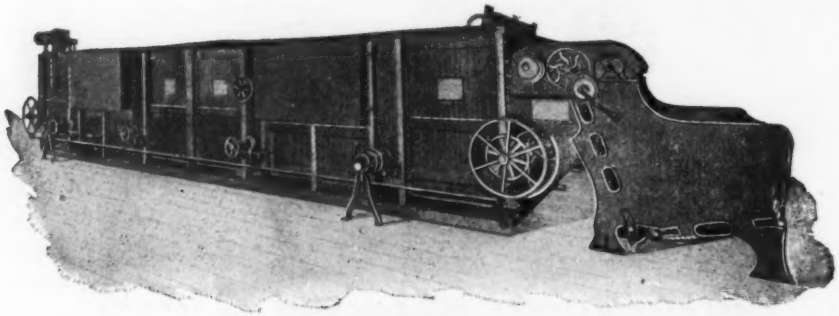

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Stock Dryers, Wool Washers,
Wool Dusters, Carbonizing Plants,
Burr Pickers, Etc.

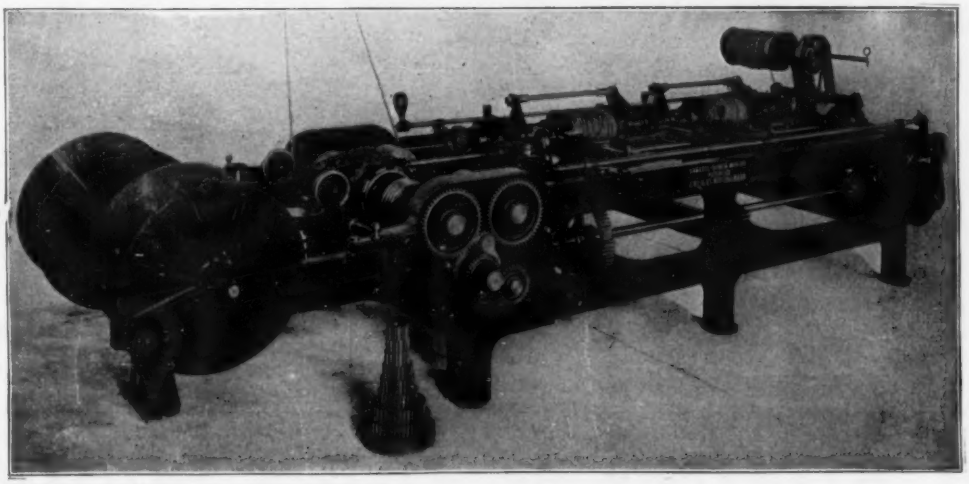
THE HASKELL-DAWES MACHINE CO.

Manufacturers of the best types of

Forming, Twisting and Laying Machinery

Which are adapted for making all kinds of

COTTON CABLE-LAID TWINE, CORD and ROPE



The Haskell-Dawes Machines are built upon a NEW PRINCIPLE, whereby the MOST POSITIVE RESULTS ARE SECURED. They occupy LESS SPACE than the ordinary type of machines, require LESS RELATIVE POWER, and will turn out a MUCH LARGER PRODUCT of Twine and Rope. The SPECIAL ATTENTION of Cotton Manufacturers is called to our new FORMING AND ROPE-LAYING MACHINES. Descriptive Catalogue Sent on Application.

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AND ALL BRAIDED FABRICS.

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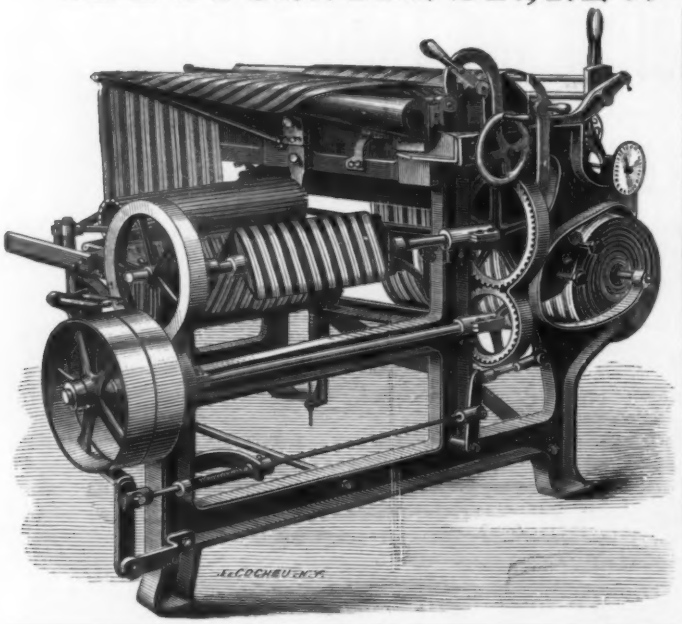

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On Cottons, Woolens and Carpets.

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and imprint the measurement upon fabrics, fold lengthwise and roll into merchantable packages all in one operation.

Prevents claims for short measure.
Marks piece numbers on each package.

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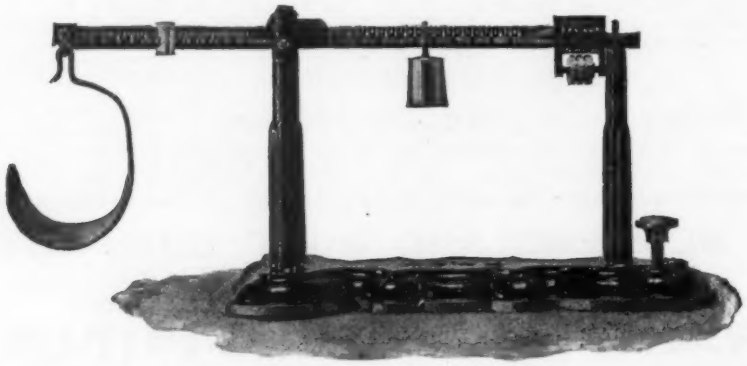
That will weigh by HALF GRAINS up to 1,000 GRAINS (over 2 1-4 oz.)



WITH THE WEIGHTS ALL ON THE BEAM. NO LOST WEIGHTS WITH THIS SCALE.

One of the most sensitive scales made. Positive and accurate. Send for prices.

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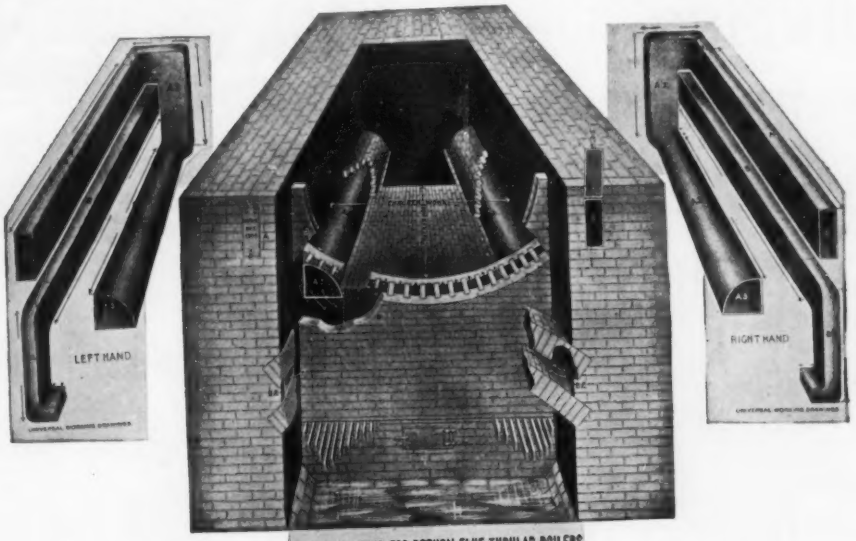
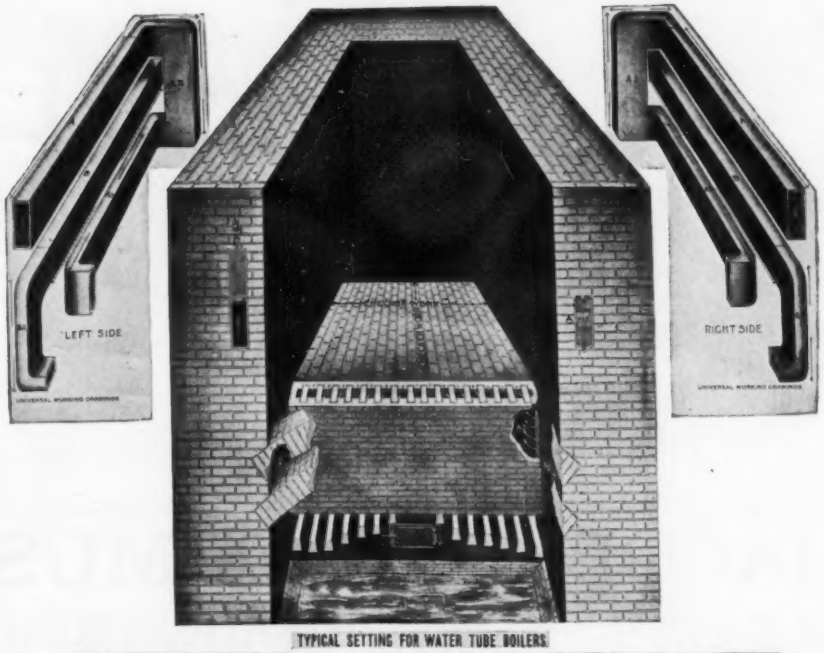
☞We make scales of every description.

The Smoke Nuisance and the Profligate Waste of Fuel is Settled for all time

By the invention and practical operation of the DR. J. B. HARRIS SYSTEM. Absolute combustion of soft coal in steam boiler furnaces. NO SMOKE. Cheap and efficient. Harris' Smoke Consuming Furnaces last as long as the boiler. 35 per cent. to 50 per cent. cheaper. By actual test evaporates 33 1-3 to 40 per cent. more water per pound of combustible. Burns any kind of fuel without smoke. Burns crude oil without smoke or odor. Pays for itself in six months. Patented March 22, 1904.



TYPICAL SETTING FOR RETURN FLUE TUBULAR BOILERS



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Heine, Franklin, Geary, and with modifications in floor of Combustion Chamber suited to Babcock & Wilcox, Zell, Root, Stirling, etc.

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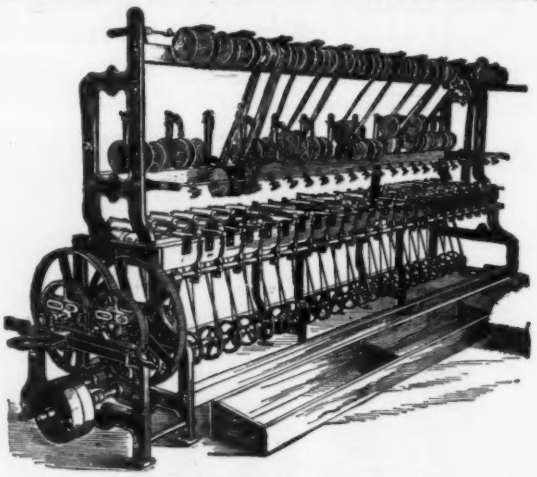
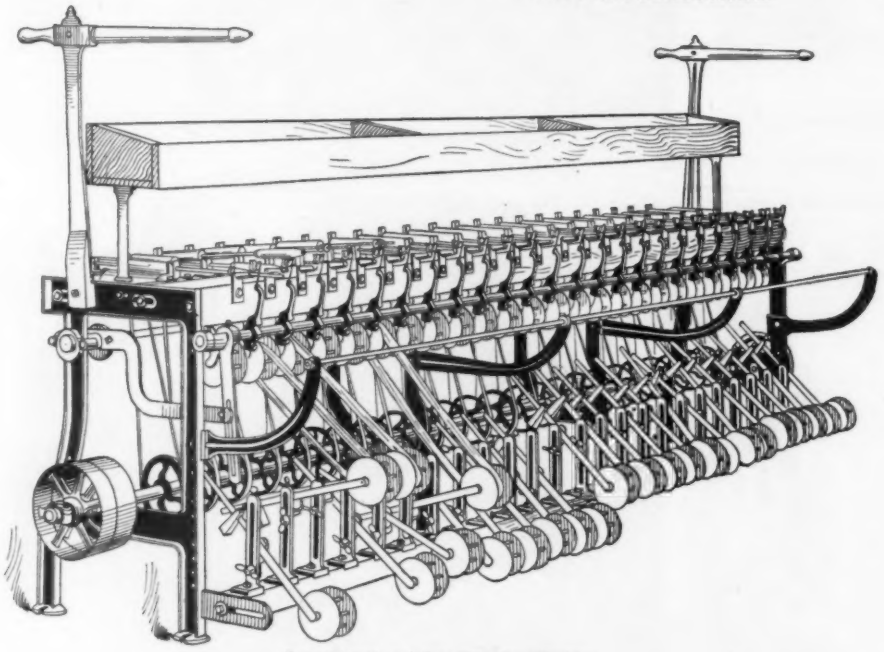


Patent Shuttle Bobbin Winder for Skeins, with Patent Variable Motion.



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FULL PARTICULARS ON APPLICATION.

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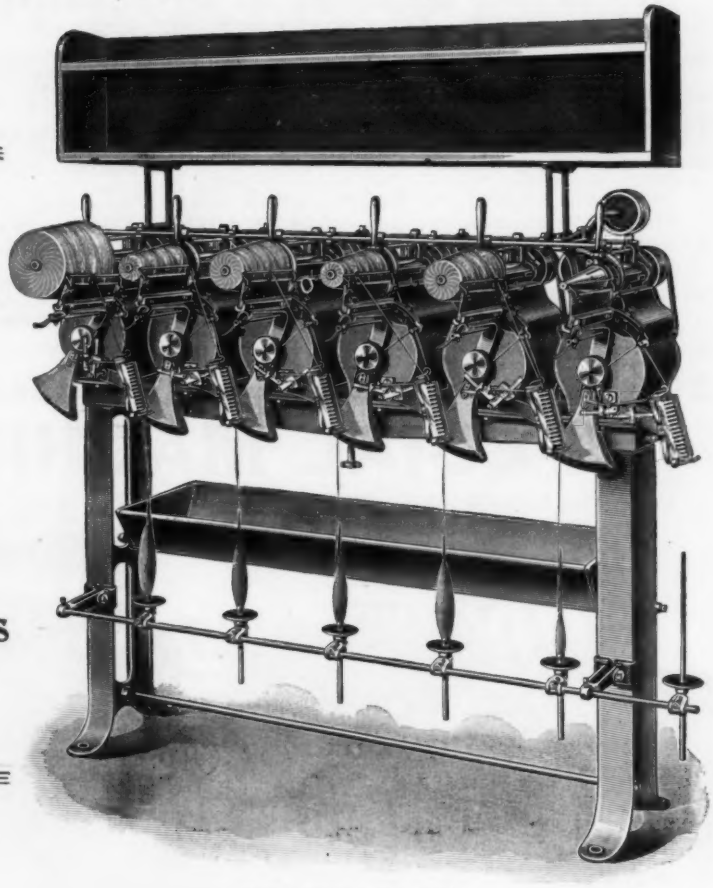
Our New
No. 50 Machines
Wind Cones
for
Knitting and
Double Fine Yarns
for
Twisting.



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They Combine { **Durability, Compactness, Simplicity, Economy.**

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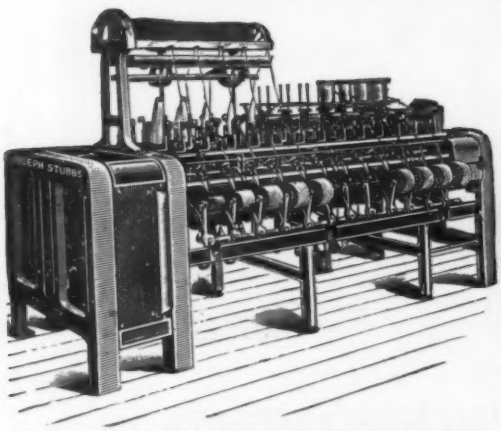
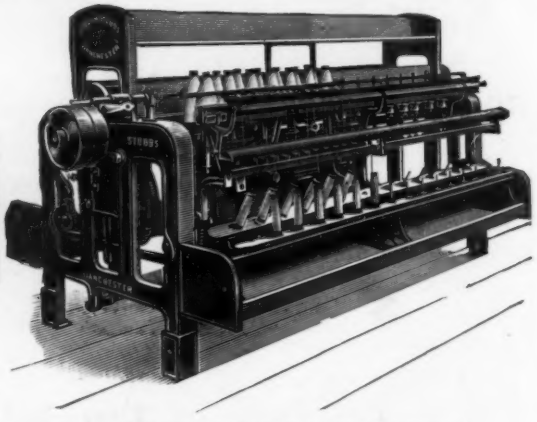


PATENT QUICK TRAVERSE COTTON GASSING FRAME.



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With Patent Tapering Motion, for Single Flanged Bobbins.

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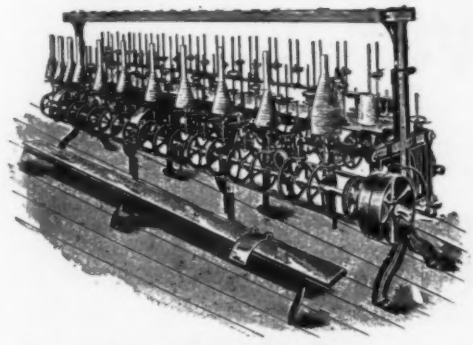

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Special Machinery Built to Order.

Write for Particulars.

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EXPERIMENTAL WORK on all kinds of Machinery OUR SPECIALTY

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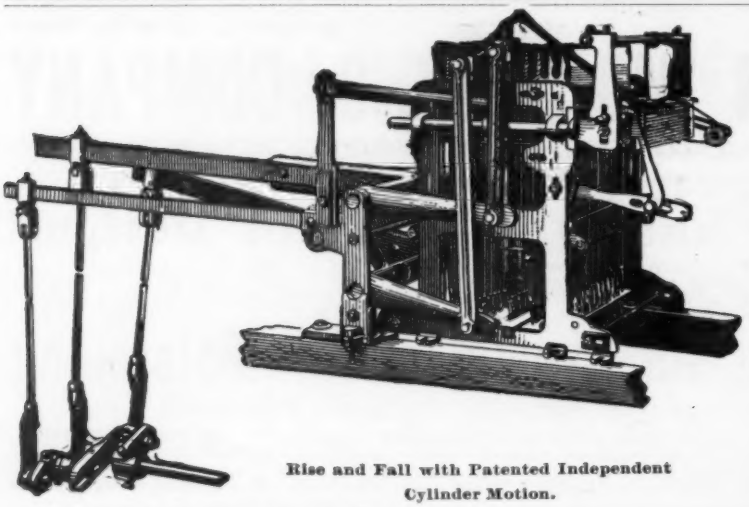

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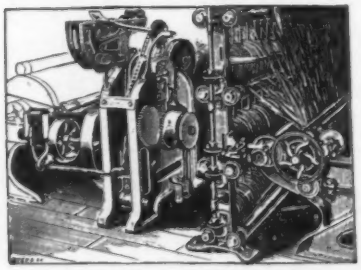

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With all the latest improvements for Wool Cards. The latest and best and only Feed that will make yarn positively even.

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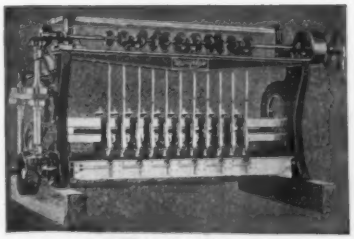

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FOR ALL PURPOSES WHERE A NUMBER OF ROWS OF SEAMS ARE REQUIRED

BUILT WITH ANY REQUIRED NUMBER OF NEEDLES.

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FOR WARPERS, BEAMERS AND SLASHERS

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Sew any fabric, wet or dry, thin or thick, fine stitch or coarse stitch.

Send for new circular telling how to get perfect work in this department.

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BLEACHING, DYEING and FINISHING MACHINERY.

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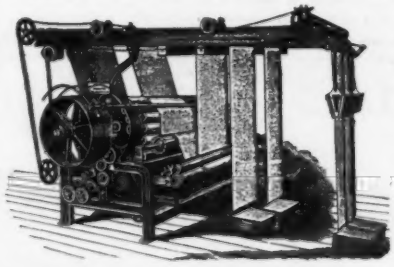
Fabric in Direct Contact with the Napping Rollers all around the Drum.

Greater Production. Better Finish. Easier Threaded. No Shifting of Filling. Better results than can be obtained with teasels.



Long or short nap as desired on cotton or woolen goods, from the lightest to the heaviest.

No heavier napping on the sides than in the centre.

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CIRCLES, HACKELS, GILLS, FALLERS and PORCUPINES.
CIRCLE KNIVES TO ANY PATTERN.

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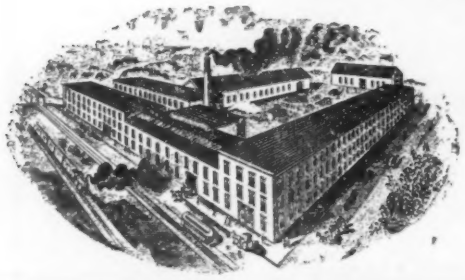

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Fulling, Scouring, Potash and Silk Soaps.

Pure Potash, Caustic Soda, Pure Alkali, Soda Crystals, Sal Soda, etc.

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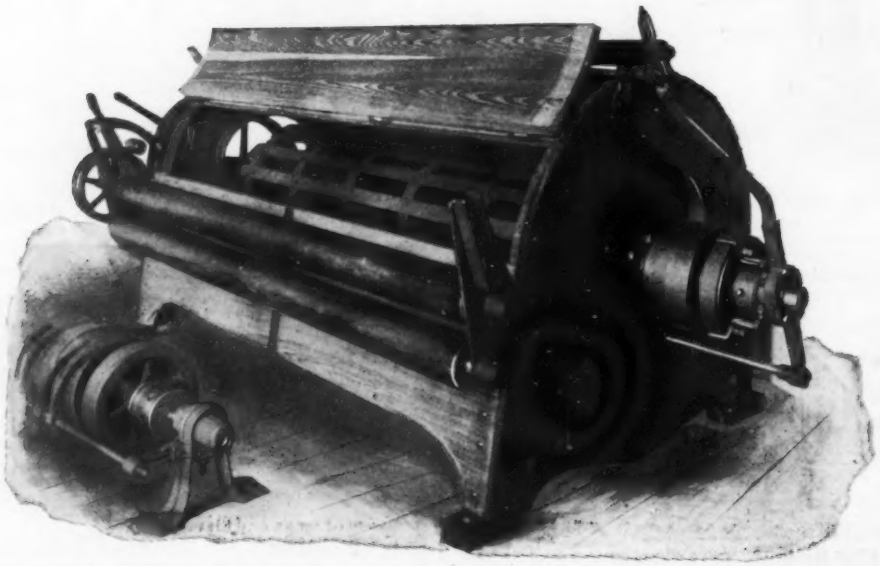
Engel-Dollfus Strasse, 38.

Eaton's Horizontal Cloth Extractor



This machine will extract the liquid from woven goods of thin or medium weight. Practical men will see at a glance its advantage over the ordinary hydro-extractor. It does not wrinkle or distort the goods or disturb the nap, and therefore especially valuable for face goods. It is built very heavy and strong, and can be run at high speed with less danger than with the ordinary extractor. The goods are run on to the drum at slow speed and properly secured, and then run at high speed, causing the water to be extracted. The cloth is then unwound slowly by a reverse motion. **Price reasonable.**

WYMAN EATON, Builder, Dolgeville, N. Y.

DINSMORE

Mill Sewing Machines

No. 9—Portable Foot-Power Rotary Sewing Machine.

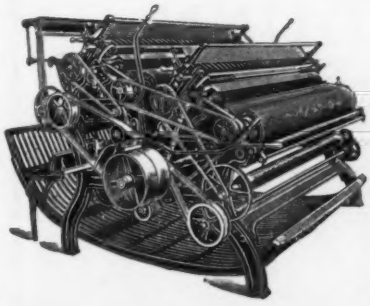
It is especially adapted for use in Cotton and Woollen Mills, Bleacheries, Print Works at the Printing Machines, in Dye Works, Cloth Rooms, at the Fulling Mill, Shears, Calendars, Gigs, Drying Machines, etc., or any of the different finishing processes in textile mills.

Manufactured by the

DINSMORE MANUFACTURING CO.,

Salem, Mass., U. S. A.

DOUBLE SHEAR



The Finest Shearing Machine in the World. Get into line. Use Double Shears. We will take your Single Shears in trade. Our representative can interest you. He will call at a word from you.

Parks & Woolson Machine Co. Springfield, Vermont.

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AND

APPRAISEMENT CO.

OF

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HERBERT G. STOCKWELL, C. P. A., President.

REAR ADMIRAL MELVILLE,

Ex-engineer-in-chief U. S. N., Engineer-in-chief.

Books audited. Cost Systems Installed. Expert Appraisements of all kinds of Machinery and Property made.

LOWELL CRAYON CO.

We are still making

THE BEST MILL CRAYON

in Fifteen Colors for COTTON, WOOLEN and WORSTED MANUFACTURERS.

Original Makers Samples Sent

LOWELL, MASS.

Established 1844.

BENJ. BUCKLEY'S SON,

(WM. J. BUCKLEY) **Gun Mill, Patterson, N. J.**

Manufacturer of all kinds of SPINDLES, FLYERS, RINGS, TUBES, CAPS, etc., for Cotton, Silk, Flax, Woolen and Worsted Machinery.

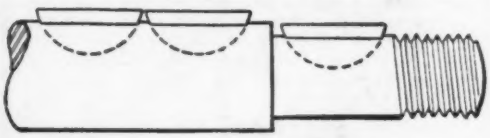
Roving Spindles and Flyers a Specialty. Light Forgings.

REPAIRING OF ALL KINDS.

Key Seating Attachment

FOR

Whiton Gear Cutter



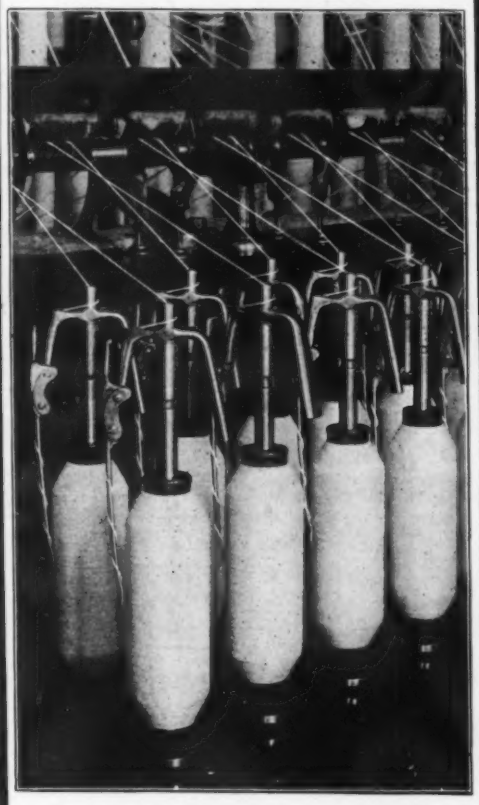
We offer an attachment for use with our Gear Cutting Machine, to cut key seats for the Woodruff System of Keying. Write for description, circulars and price.

THE D. E. WHITON MACHINE CO.,

19 Oak Street, New London, Conn.

THE DUNN FLYER

Presents new principles and methods in Flyer construction that have proved their value and made its use of marked advantage.



3½ Inch Diameter Bobbins

are built with 7x3 Dunn Flyers on 4½" space frame with the further advantage of being able to run as fine as 15 hank roving on same flyers. Further information may be promptly obtained by addressing the

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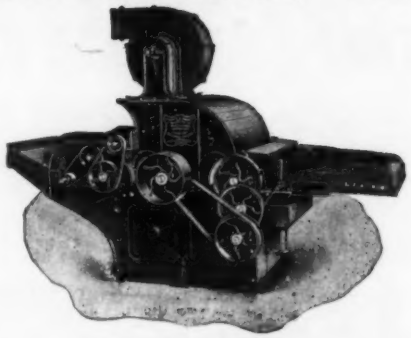
BOSTON, - MASS.

CURTIS & MARBLE MCH. CO., WORCESTER, MASS.



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Wool Burring and Picking Machinery.

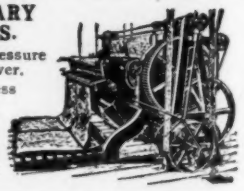
Cloth Finishing Machinery.

New and Second-Hand Cloth Presses

LATEST MILLER ROTARY STEAM CLOTH PRESS.

Patent Flexible Steel Bed. Pressure automatically appplied by power.

1 6/4 double bed second-hand press
1 8/4 " " " "
1 6/4 single " " "
at a bargain.



Miller Press & Machine Co.
WOONSOCKET, R. I.

Lowell Textile School

Fall Term Opens Tuesday, Sept. 27, 1904.

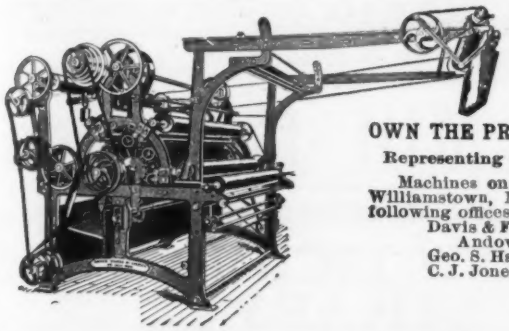
Applications for admission now received.

Courses in

Cotton Manufacturing, Woolen and Worsted Manufacturing, Designing, Chemistry and Dyeing, Decorative Art, Mechanical and Electrical Engineeing

FOR FURTHER PARTICULARS APPLY TO

WM. W. CROSBY, Principal
Moody Street and Colonial Avenue,
LOWELL, MASS.



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OWN THE PRINCIPAL PATENTS ON NAPPING MACHINES.

Representing the latest French, English and American Patents.

Machines on Exhibition and Samples Napped at North Andover and Williamstown, Mass., or Philadelphia, Pa., on application to any of the following offices:

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Established 1870

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Providence, R. I.

Builders of Improved

Cloth Tentering and Drying Machinery

for WOOLENS, WORSTEDS, FELTS, etc.

Built Upright or Horizontal with Low Down Feed

Ventilating Fans a Specialty

Send for Catalogue

HENDERSON'S

Double Carding Process for Wool

(Patented May 10, 1904)

Is a Great Success.

Manufactured By **JAMES H. WHITTLE,** 150 Harlow St., Worcester, Mass.

INCREASES PRODUCTION AND QUALITY

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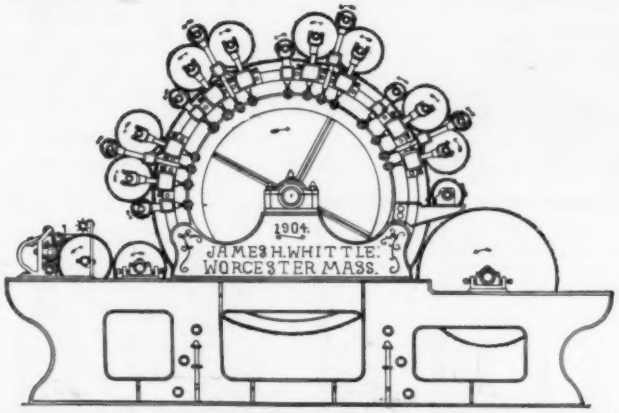

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APPLIED TO EITHER OLD CARDS OR NEW

WOOL AND WORSTED MACHINERY

Including Carding Machinery for Wool and Worsted, Yarn Twisters, with or without Novelty Attachments, Yarn Dressers, Reels, Beamers, Single or Double. Yarn Spoolers, Dresser Creels, Cloth Dryers, of all widths, New Rotating Skein Dryers, Four and Eight Drum Spoolers, Improved Hydro Extractors, Improved Dusters with Fan, New Pattern Mixing Picker, Skein Drying Reels, etc.

ANYTHING

Entire Outfits for New Mills, or small and odd items that that you don't know just where to obtain, can be found at the

AMERICAN SUPPLY CO.,
PROVIDENCE, R. I.

in Mill Supplies.

DUCK AND TICKING LUG STRAPS

Our duck lug straps are all duck and our ticking straps all ticking. Every strap which bears our trade mark, whether or not bought direct from us, is guaranteed to be made throughout of the same kind and quality of material as the outside.

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E. L. TEBBETS & CO.,
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Thread and Silk SPOOLS of any description.

We are located in the best white birch region. Our work and prices seem to satisfy the most particular customers. We can give any finish desired. Estimates furnished on samples submitted.

The Best That Money Can Buy

SPINNING RINGS.
TWISTER RINGS.
RING HOLDERS.
TRAVELER CUPS.
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MAKERS OF

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For PLAIN and FANCY WEAVING.

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Paper Cloth Boards
For Textile Mills

PERFECT RIGID CLOTH BOARD TRADE MARK

All weights and sizes furnished by thousand, ton or carload. Prompt delivery assured. Samples and prices on request.

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DIXON LUBRICATING SADDLE CO., Bristol, R. I.

SOLE MANUFACTURERS OF

Dixon's Patent Locking Saddles and Stirrups.

The weight can be taken off and put on to the middle rolls, without stopping your frames, when long staple cotton is used.

THE STIRRUP IS ALWAYS IN PLACE.
NO BENT STIRRUP RESTING ON ROLLS.

Manufacturers of all kinds of **Saddles. Stirrups and Levers.** Send for Samples and Prices.

Spinners' Supplies in general.

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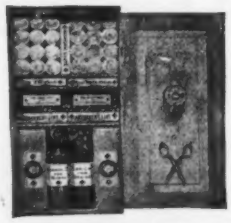
Card Clothing of Every Description

HENRY ASHWORTH, Agt. FALL RIVER, MASS.

Somebody Gets Hurt



Cut of No. 1

Nobody knows what to do or has anything to do with, until the doctor comes and every minute's delay counts against the injured.

THE STANDARD ACCIDENT CABINETS

Are designed for just such emergencies.

CONTENTS.

6 rolls linten bandages	2 in.	2 packages absorbent lint.	
6 " " "	2 1-2 "	2 " " cotton, 1-4 lb.	
3 " cotton "	1 1-2 "	1 12 oz. bottle carron oil.	
3 " " "	2 "	1 12 " " arnica.	
3 " " "	2 1-2 "	1 roll adhesive plaster.	
3 " " "	3 "	1 package iodoform gauze.	
2 packages first aid for wounds.		1 pair scissors.	
2 " linten gauze.			

These Cabine's contain only the highest grades of medicines and bandages which are thoroughly sterilized and antiseptic. Send for Circular. Price No. 2, $10.00; No. 1, $7.00.

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STEEL AND BRASS

MAILS.

Liberal Discount to Dealers.

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REEDS, HARNESSES, LINGOES, SHUTTLES AND QUILLS.

TEXTILE MACHINE WORKS

THUN & JANSSEN, READING, PA.

Manfrs. of *BRAIDING MACHINES*

for making Dress Trimming Braids, Cotton Tapes, Underwear Braids, Shoe Laces, Spindle Banding, etc. Winders, Doublers. Measuring Machines, Reelers, Singeing and Finishing Machinery. Special machinery.

WARD & VANDEGRIFT,

Successors to The Bridesburg Mfg. Co.

In the Manufacturing of **SPINDLES,**

For Cotton, Woolen, Worsted, Silk and Flax Machinery. Manufacturers and Repairers. Also Flyers, Steel Caps, Bolsters, Steps, Tubes, Etc.

ELMER, SALEM CO., .. N. J.

SAVE
Their Cost
In Freight.

THE CHAFFEE PATENT CLOTH BOARD,

Made of paper and wood,
Needs no covers,
Will not split or warp;
Not liable to break.

MFG. BY CHAFFEE BROTHERS COMPANY, OXFORD, MASS.

BOX SHOOKS and CLOTH BOARDS.

Clean
LIGHT
Strong

Shaw's "Victor" Travelers

Manufactured by

VICTOR SHAW RING TRAVELER CO.

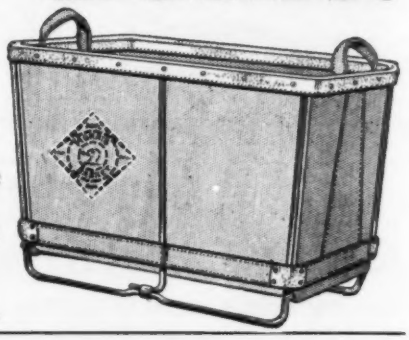
Incorporated 1899.

23 Sabin Street, PROVIDENCE, R. I.

A Mill Basket

That Will Stand Hard Knocks

Is the one to buy.



Our duck baskets are standing the knocks in the largest mills in the New England States.

Send us an order today. If they are not what we claim we will make good.

MORRIS & CO., Groveville, N. J.

The LANE Patent Steel-Frame

CANVAS MILL BASKET

FIG.22.

Made of extra cotton duck. Frame of round spring steel and guaranteed against breakage. Rim bound with leather. Perfectly smooth inside. Light weight, strong and durable.

There are other special features in Lane Baskets to which is due their widely increasing popularity. Write for price list to

W. T. Lane & Brother,

MANUFACTURERS,

PoughKeepsie, N. Y.

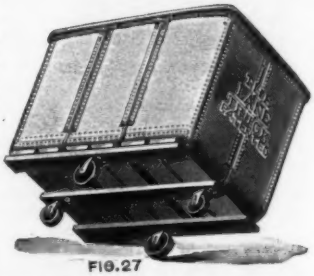
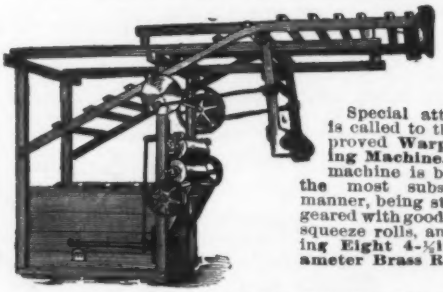


FIG.27

Sold by Leading Mill Supply Houses.

The Reliance Warp Dyeing Machine.



Special attention is called to this improved **Warp Dyeing Machine.** This machine is built in the most substantial manner, being strongly geared with good, heavy squeeze rolls, and having **Eight 4-½in. Diameter Brass Rolls.**

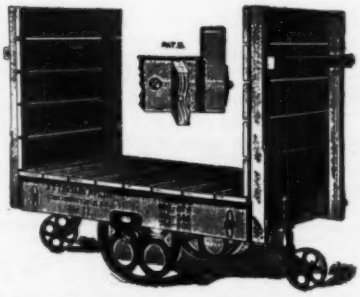
This machine, with our Improved Plater-down has met with marvelous success, and parties desiring machinery of this class, can make no mistake on ours For further particulars and prices, address

CHARLES HART,

Hedge and Brown Streets, FRANKFORD, PHILA.

TOWSLEY "Non-Breakable"

TRUCKS For Dye Houses, Finishing Works, Cotton or Woolen Mills



No. 11

Platform 24x48 in. Ends 24x30 in., wood work of hard maple.

Iron work all malleable, except centre wheels. All trucks shipped K. D. flat at lowest rate. Prompt shipment and satisfaction guaranteed.

John T. Towsley Mfg. Co. 1075-1083 Evans Street CINCINNATI, - OHIO

Laminar

ROVING CANS, BOXES, BASKETS. TRUCKS, ETC.

Sullivan

SEAMLESS MANILLA FIBRE ROVING CANS.

Walrus

FIBRE ROVING CANS AND OTHER WAREHOUSE, STORE AND FACTORY RECEPTACLES.

SOLE PROPRIETORS AND MANUFACTURERS

AMERICAN VULCANIZED FIBRE COMPANY,

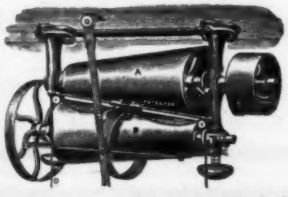
12 Pearl Street, BOSTON, MASS.

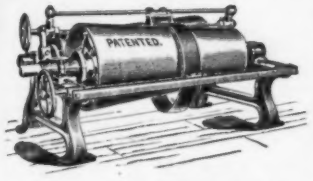
EVANS' FRICTION CONES.

Eight Thousand Sets in Operation in This Country and Europe.

A partial list of manufacturers who have Evans' Friction Cone Pulleys in operation, transmitting from ONE TO FORTY HORSEPOWER:

National Biscuit Co., Richmond, Ind., 300 sets. Merrimack Mfg. Co., Lowell, Mass. 20 sets. Arnold Print Works, No. Adams, Mass., 11 sets. John & James Dobson, Philadelphia, Pa., 34 sets. Stinson Bros., Philadelphia, Pa., 40 sets. Frederic J. Falding, New York, N.Y., 20 sets.





Smith & Winchester Co., So. Windham, Conn., 230 sets. Furguson & McRae, Belfast, Ireland, 25 sets. Mercantile Laundry, So. Windham, Conn., 250 sets. Washburn & Moen, Worcester, Mass., large number, all sizes. Dennison Tag Co., Boston, Mass., large number, small sizes. Saco & Pettee Machine Co., Newton, Mass., 275 sets. Pacific Mills, Lawrence, Mass., 13 sets.

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Vulcan Fibre Roving Can.

BODY—Vulcanized Fibre. SIDE SEAM—Riveted with Patented Clinched Rivets. RINGS—Tinned Steel, Brazed Joints, Curled Edges. BOTTOM—IXXX. Tin Star Corrugation; Fastened without the use of nails or screws, will not crack, warp or shrink and cannot come out. FINISH—Coated inside and out with moisture proof coating, handsome and smooth. WEIGHT—About one-half pound per inch diameter. SIZE—All cans to any exact size, perfectly round and true. DURABILITY—Superior to any other can.

Also Manufacturers of

HILL'S IXXX TIN AND GALVANIZED IRON DYE HOUSE CAN.

James Hill Manufacturing Co.,

PROVIDENCE, R. I.

THE ONLY SEAMLESS MILL BASKET Manufactured by CRANE BROS., Westfield, Mass.

SEND FOR PRICE LIST.

WOONSOCKET NAPPING MACHINERY CO.,

WOONSOCKET, R. I.

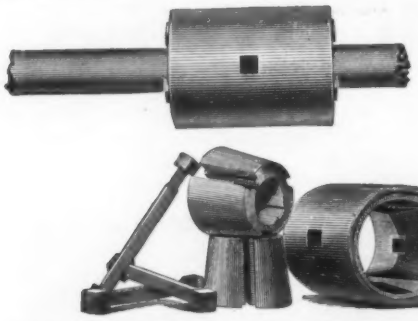
Napping, Shearing and other Machinery

For Finishing Woolen, Worsted, Cotton, Knit Goods, Blankets, etc.

Greene Nappers. **French Nappers.**

Shearing Machines a Specialty.

Special attention paid to Repairing all kinds of Shear Rests and to Repairing and Grinding of all kinds of Shear Blades.



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DOUBLE CONE VISE COUPLING

has a way of holding shafts together, that no other COUPLING can equal.

WILLIAM SELLERS & CO., INCORPD.

PHILADELPHIA, PA.

Makers of

SHAFTS,
COUPLINGS,
PULLEYS,
HANGERS,

and all most approved appliances for the

Transmission of Power.

SEND FOR CATALOGUE AND PRICE LIST.

MACHINE TOOLS.
INJECTORS. POWER CRANES.

Singeing Machines

FOR ALL KINDS AND WIDTHS OF GOODS.

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Wait and Rye Streets, PATERSON, N. J.

CORRESPONDENCE SOLICITED.

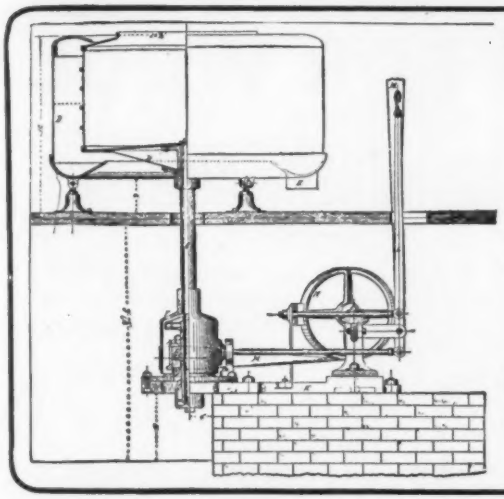
SALEM ELEVATOR WORKS

SALEM, MASS.

ELEVATORS

ESPECIALLY ADAPTED FOR MILL USE.

SEND FOR ILLUSTRATED CATALOGUE AND ESTIMATE.



Weston Hydro Extractors.

Special Machines for Acid Work.

SHAFTING, PULLEYS,
FRICTION CLUTCHES, Etc.

American Tool and Machine Co.,

Incorporated 1864. Founded 1845.

109 Beach Street, Boston, Mass.

THE MONEY MAKERS.

You will be surprised to learn

The SMALL EXPENSE

of fitting your machines with

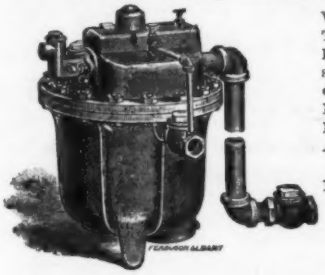
TUCKER OIL CUPS

Send for Samples and Price List.

W. & C. F. TUCKER, .. Hartford, Conn.

STEAM TRAPS

NEW FEATURES: Wearing Parts, Valve and Seat Renewable.



Class A Return Trap

We manufacture Steam Traps for all duties, High and Low Pressures, returning the Condensation back into Boiler or discharging to Hot Well, Tank or Atmosphere.

No Elastic Gaskets, all Joints Ground Metal and Metal.

SEND FOR Catalogues A, B, and C.

ALBANY STEAM TRAP CO.,
ALBANY, N. Y.
Established 1870.
FRED'K TOWNSEND, Pres. JAMES H. BLESSING, Gen. Mgr.

WICKES

Vertical Water Tube

BOILERS

Built by
WICKES BROTHERS,
SAGINAW, MICHIGAN.

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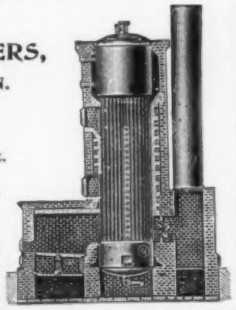

SCAIFE SYSTEM OF SOFTENING AND PURIFYING WATER

FOR STEAM BOILERS, TEXTILE WORKS, BLEACHERS, ETC.

PREVENTS BOILER SCALE

Furnishes pure, soft, clear water for every purpose. Results Guaranteed. Send for illustrated Catalogue

Founded 1802

WM. B. SCAIFE & SONS COMPANY, PITTSBURG, PA.

BRETON OIL FOR WOOL

MANUFACTURED BY

BORNE, SCRYMSER COMPANY.

(6) Breton Oil can be scoured with a very mild soap, much milder than is required to scour the best of animal oils, consequently can be used on the most fugitive and delicate colors.

See point No. 7 next month.

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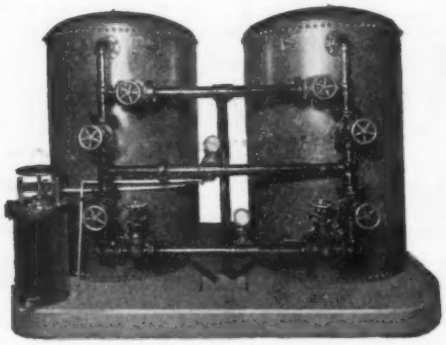
Works: Elizabethport, N. J.



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FILTERS PRESSURE and GRAVITY

WATER SOFTENERS INTERMITTENT and CONTINUOUS

There is only one Filter, the

HUNGERFORD-ELFRETH,

the only filter which exceeds its guarantee.

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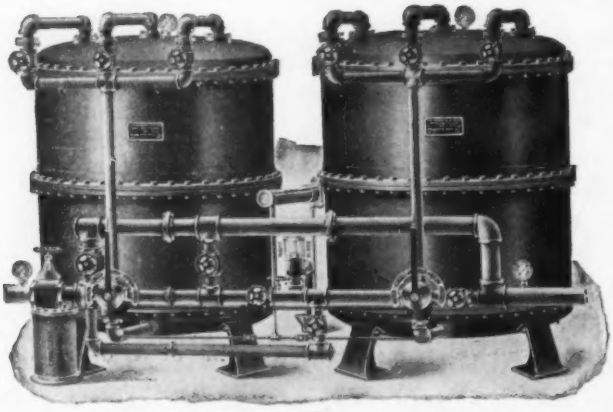

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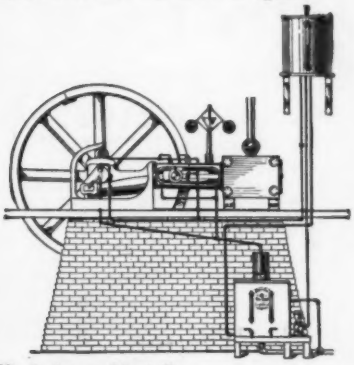

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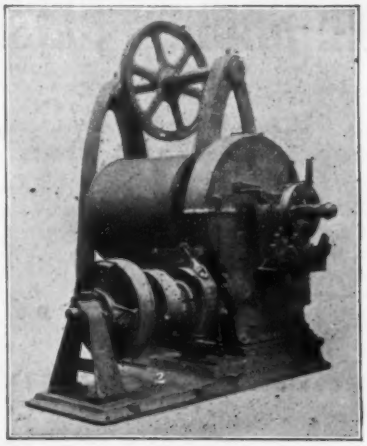

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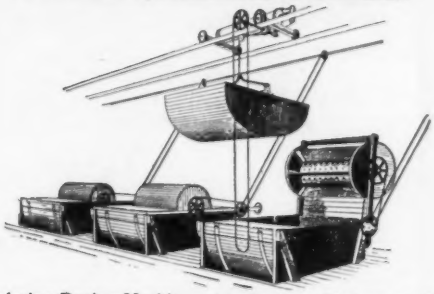

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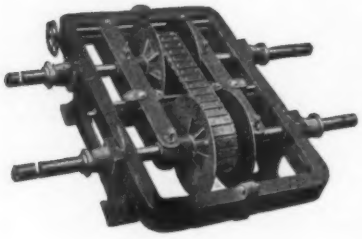

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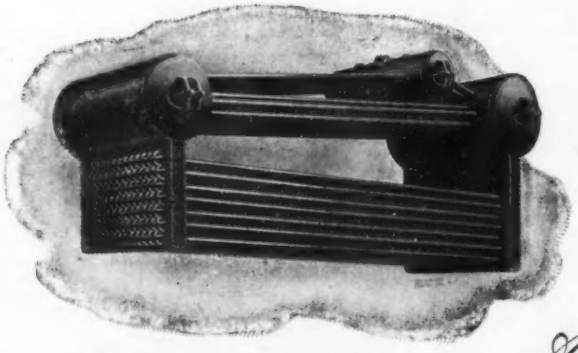

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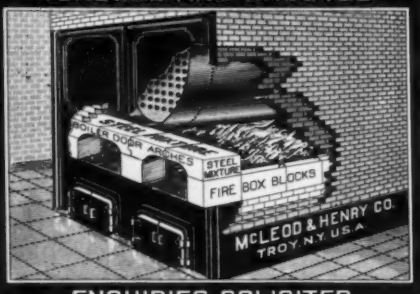

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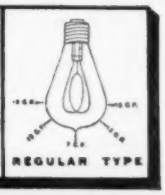

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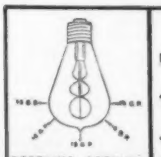

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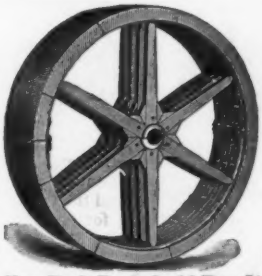

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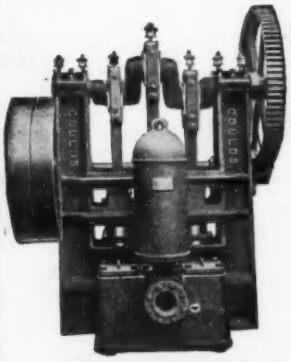

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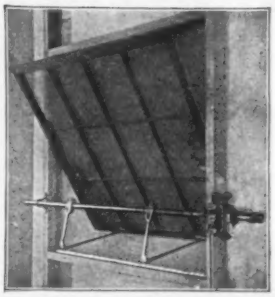

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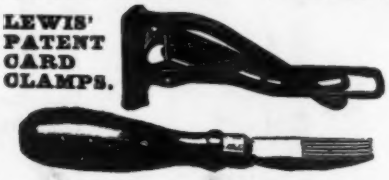

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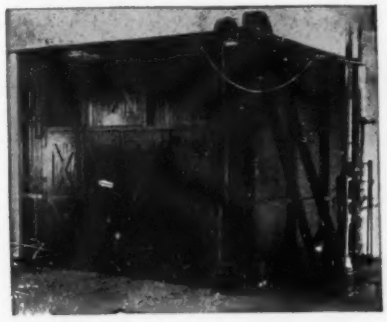

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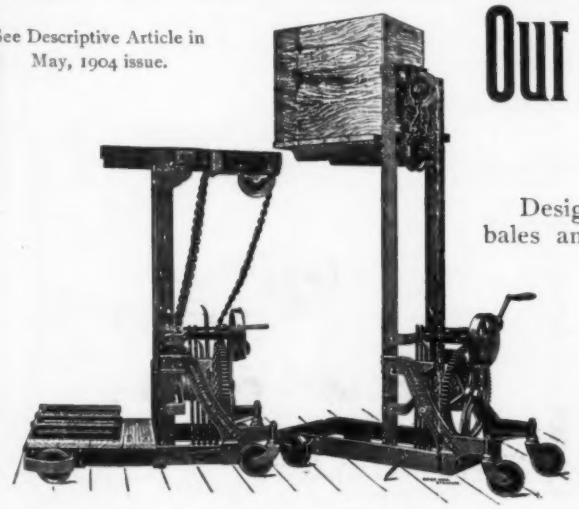

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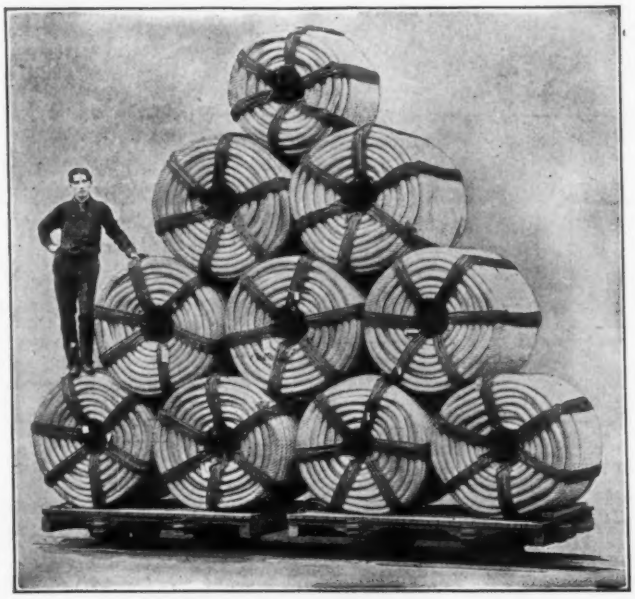

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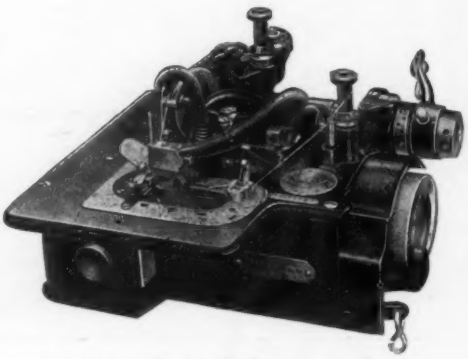

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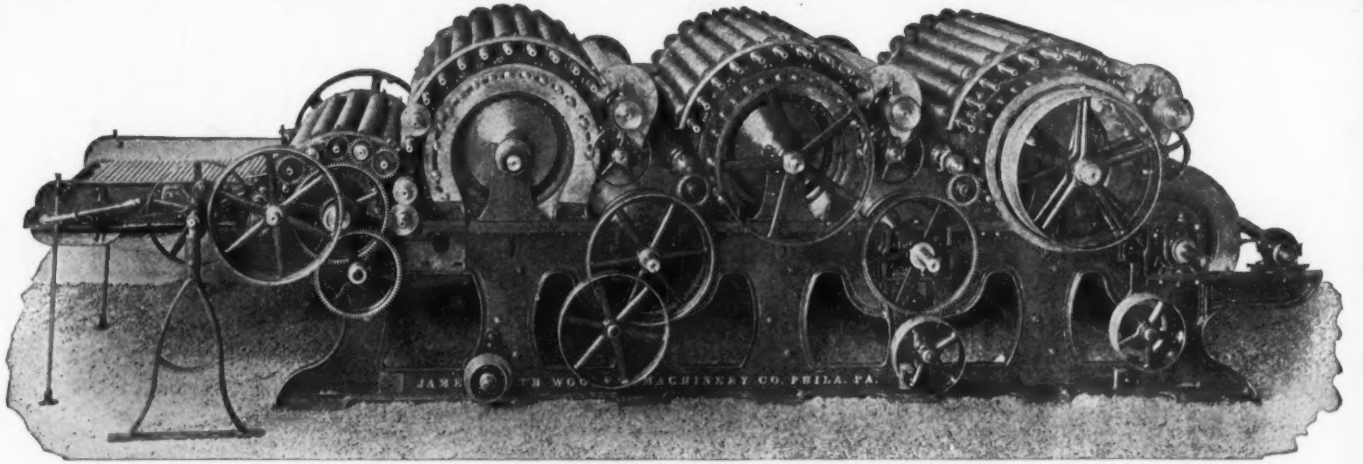

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PART I. Contains a complete directory of all the textile establishments in the United States and Canada. It tells what goods are made, the number of sets of cards, spindles, looms, whether and what they dye or finish, steam or water power, who the selling agents are, the names of the officers, superintendent and buyer.

There are 22 textile maps; gives population of town and railroad connections.

PART II. Is the Yarn Trade Index, containing classified lists of yarn spinners, arranged according to kind of yarn, size and number spun, etc. All the mills with worsted machinery are included in this section.

PART III. Contains Classified List of mills doing order and commission work, also dyeing, finishing, bleaching and printing establishments, classified according to the kind of work done, and so far as possible giving width of goods handled; also shoddy, extract and flock manufacturers and wool scouring establishments.

PART IV. Manufacturer's Selling Agents and Dry Goods Commission Merchants, giving the name and address of concern, character of goods handled, different departments, with managers, list of manufacturing clothiers, and suit and cloak manufacturers, giving specialties and buyers names. A list of city offices of textile mills is given.

PART V. Dealers and Brokers in raw materials and stock, including wool and shoddy dealers and brokers, cotton dealers and brokers, factors and buyers and wholesale rag dealers making a speciality of textile interests.

PART VI. Buyers Index of Textile Machinery and Supplies, and statistics showing textile machinery in the United States, giving spindles, looms, knitting machines, etc.

The Directory of the Knitting Trade in the United States and Canada

is published early each year by Lord & Nagle Company. It is a complete directory of all the establishments in the United States and Canada manufacturing knit goods. It gives the location of the mill, the capital stock, names of the officers, superintendent and buyer, class of goods made, the machinery, including number of knitting machines and sewing machines, selling agents, if any, and in most cases the class of yarn bought. It also contains a list of commission houses making a specialty of knit goods, and jobbers and large retailers having knit goods department, in most cases giving the names of manager in charge of knit goods. The book is small so that it may be carried in the pocket. Price is $1.00.

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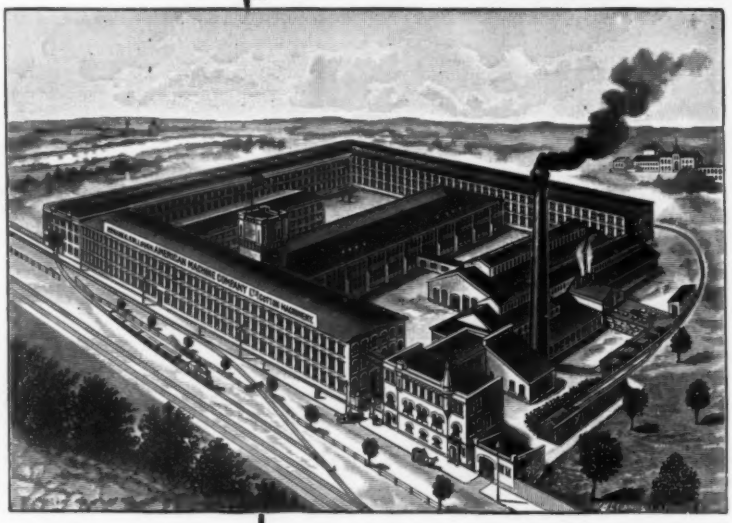

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The Textile World and Textile Record.

VOL. 27. (NEW SERIES.) JULY, 1904 No. 4.

Monthly Comment.

The Zurich Cotton Congress.

Delegates from European countries having 70,000,000 cotton spindles, or over two-thirds of the spindles throughout the world met at Zurich, Switzerland, some weeks ago to discuss the situation in the cotton industry and devise remedies for the evils that threaten it. The principal, almost the only subject to receive attention on that occasion was the shortage of cotton, and, as might have been expected, the conference proved a failure. The speculator was roundly denounced and on motion of Herr Malter of Germany a resolution was adopted urging the cotton exchanges of New York, New Orleans, Liverpool and Alexandria to do what they could to stop speculation in cotton by people who have no direct interest in this market.

Possibly the rarified air of Switzerland may have had some peculiar effect on the usually clear headed men who met each other at this Zurich Congress. The eagerness with which every member of the New York or Liverpool cotton exchange will try to prevent any one except cotton manufacturers from paying commissions for buying cotton on the exchange can easily be imagined. A Lancashire spinner proposed an incorporated agency for buying and selling cotton, the stock to be held only by cotton planters and spinners. One whole day was occupied in demonstrating how this scheme would enable planters to sell cotton at a high price and spinners to buy it at a low price.

Herr Wilckens of the German Colonial Committee told about growing cotton in the German colonies, stating that by government aid, the payment of money and honor prizes for special productions of cotton and by a reduction of freight rates, the 1904 crop in Togo would amount to 400 bales, and then quoted the American Consul-General at Berlin to the effect that "whether it pleases us (Americans) or not, the time will come when the cotton of our Southern States will no longer have undivided sway."

The French, Italian and Russian delegates reported on the progress made in cotton growing in their respective colonies. Boundary lines between British, French, German, Belgian, Russian and Italian possessions disappeared when the delegates talked cotton. The sole cry was: We want cotton and don't care where it comes from.

At the last session, held on the summit of the Rigi, 6,000 feet above sea level, an International Committee was appointed to watch over the interests of the cotton trade. Having thus safeguarded the cotton industry, the Congress adjourned, and the delegates were left free to enjoy the unrivaled scenery of the Swiss Alps.

Artificial Silk.

The manufacture of artificial silk promises to become an important branch of the textile industry. The French and German factories are unable to supply their orders for this material, and have largely increased their plants in the last twelve months. Richard Guenther, United States Consul-General at Frankfort, Germany, states that the production of artificial silk by German mills is five times as large as in 1900. The exports of artificial silk from Germany, France and Belgium to the United States for the year ending June 30, 1903, amounted to $434,034. Owing to the limited supply and the strong demand for the product the price has advanced steadily.

The processes of manufacturing artificial silk are jealously guarded by the European manufacturers and the rights of German manufacturers to their trade secrets are vigorously defended by the government. This is shown by the fact that the sale of a book published in France describing the machines and processes of a German artificial silk mill has been forbidden in Germany and all copies in the German Empire have been seized.

The General Artificial Silk Company of Philadelphia, Pa., which is the only manufacturer in this country which has its product on the American market has established a second plant at Toronto Junction, Ontario, Canada. The original plant of this company at Lansdowne, Pa., has recently been increased to a capacity of 500 lbs. of yarn per day, and plans are being made by it for the erection of a third and much larger plant in Philadelphia. This company is manufacturing under what is known as the "Alkali-Cellulose" process, discovered in England, which was purchased by it for this country and Canada, and first brought to a successful and commercial basis at Lansdowne.

It is claimed that by this process a better product is obtained and that the raw materials used in the French and German processes cost a great deal more in this country than they do abroad, making the figure prohibitive for their manufacture in the United States, where cheap labor is also absent.

It is said the Philadelphia company is not able at present to supply the demand.

Artificial silk is used for passementeries, tapestries, brocades and fancy dress goods. It has already been used in place of silk and mercerized cotton in many fabrics in which a few years ago its application was considered problematical.

A New Plan of Textile Education.

For some time past the Young Men's Christian Association of North Adams, Mass., has been giving instruction in textile manufacturing, and the innovation promises to be an important development in this branch of technical education. Textile operatives outnumber those in any other branch of industry in North Adams; it was for this reason that W. R. Hale, general secretary of the association, selected a textile course as the best way of giving useful instruction to the work people of the city. Three practical mill men have had the work directly under supervision and they have been assisted by eight manufacturers who have acted as advisers. Mr. Howard Fuller, employed by the Arnold Print Works, and formerly a student in the Philadelphia Textile School, has taught the class in designing. Mr. James Metcalf, employed at the Eclipse Mill, having studied at the New Bedford School, has had charge of the students in mill arithmetic.

The class has met on twenty-six evenings to receive instruction in fabric structure and designing, cloth analysis and mill calculation. On account of the satisfactory results of the first year, just closed, the work will be extended to include instruction in other branches of textile manufacturing. The students have shown great interest in the course, and the mill owners have given their earnest support to the enterprise.

It is a practical and common sense method of reaching that very large number of textile workers who are anxious to know more about their trade, but who are unable to avail themselves of the advantages of the regular textile schools. The plan inaugurated at North Adams is capable of indefinite extension to other cities and industries. An intelligent and conservative development of such technical instruction by local associations will in all probability prove to be of very great benefit to both manufacturer and operator.

A Law Against Graft.

At its last session the Legislature of Massachusetts passed a bill which was signed by the Governor to prohibit the corrupt influencing of agents and employees. The first section of this act is as follows:

Whoever corruptly gives, offers or promises to an agent, employee or servant, any gift or gratuity whatever, with intent to influence his action in relation to his principal's, employer's or master's business; or an agent, employee or servant who corruptly requests or accepts a gift or gratuity or a promise to make a gift or to do an act beneficial to himself, under an agreement or with an understanding that he shall act in any particular manner in relation to his principal's, employer's or master's business; or an agent, employee or servant, who, being authorized to procure materials, supplies or other articles either by purchase or contract for his principal, employer or master, or to employ service or labor for his principal, employer or master, receives directly or indirectly, for himself or for another, a commission, discount or bonus from the person who makes such sale or contract, or furnishes such materials, supplies or other articles, or from a person who renders such service or labor; and any person who gives or offers such an agent, employee or servant such commission, discount or bonus, shall be punished by a fine of not less than ten dollars nor more than five hundred dollars, or by such fine and by imprisonment for not more than one year.

The evil against which this bill is aimed exists in the textile industry, although the extent to which it prevails there is often overestimated. The complicated character of textile processes and the great value of the material in process of manufacture create very favorable conditions for the growth of this system of graft. Take, for example, a 500-loom worsted mill with a daily product of, say, 10,000 yards of piece dyed goods. The dyer in this mill receives each day this quantity of cloth, 6 miles in length and valued at about $10,000. He is expected to color it various shades to match selling samples so that not only will each piece be uniform in color, but that the different pieces of the same color will also match in shade within practicable limits. The manufacturer is looking for results. It is of vital importance to him that the goods shall come out right and without serious interruption. The cost of dyestuff and chemicals for this work, large though it may be in the aggregate, is small compared with the value of the cloth itself and the loss that may be caused by damaging the product or restricting its production. Under such conditions it is natural that the manufacturer, whose property is thus entrusted to the dyer, should give that employee every facility for doing the work, and trust to his judgment regarding the materials used in his department.

The same conditions are found in many other departments of the mill and give the foreman the opportunity to make arrangements with supply dealers by which their goods are to be purchased in return for something of value given to the overseer. The practice, of course, is downright stealing from the employer and deserves to be treated as such. There can be no question on this point. There is considerable doubt, however, whether the system can be successfully restrained by law. The Massachusetts statute may serve a useful purpose by providing a penalty for the crime, but the remedy for the evil is to be found in the mill rather than in the courts. The manufacturer may find it necessary to entrust his superintendent or overseers with the selection of certain supplies, but he need not keep any man in his employ, whom he considers guilty of accepting bribes. There are enough honest men left to fill such positions.

Moreover it is not likely that the graft system will take root in a mill with a properly organized purchasing department. It is difficult to imagine a case of graft in a mill which cannot be eliminated by ordinary attention to business on the part of the mill owner. In giving their business this attention manufacturers should be careful not to try to reach the guilty by bringing all employees under suspicion.

Imported Woolen and Worsted Goods.

Although the imports of woolens dropped from $1,188,609 in May, 1903, to $762,371 in May, 1904, the total for the 11 months ending May, 1904, is $16,404,430, a slight increase for the corresponding 11 months of the previous year. Estimating the June, 1904, imports at the monthly average of the preceding 11 months, the total for the year is $17,895,742.

The Canadian Tariff.

Last month the Canadian Government announced various changes in the tariff rates of the Dominion, those in the woolen schedule being as follows:

Notwithstanding anything contained in Schedule D, the minimum duty on the undermentioned articles shall be as follows:

Manufactures as described in Item 394 of Schedule A (excepting blankets, flannels, bed comforters and counterpanes) composed wholly or in part of wool, worsted, the hair of the alpaca, goat or other like animal, 30 per cent. advalorem. (Old duty 35 per cent.; under British preference, 23 1/3 per cent.; decrease in preference, 6 2/3 per cent.)

Twine and cordage of all kinds, n. e. s., 20 per cent. advalorem. (Old duty 25 per cent.; reduces British preference duty from 16 2/3 per cent. to 13 1/3 per cent.)

Minister of Finance Fielding referred to the objects of these changes as follows:

The complaint is made very largely by our woolen manufacturers and by various public men who sympathize with them, that although on the better grades of goods they can fairly compete with all persons, even the British manufacturer, a very large proportion of the import of British woolen goods coming into Canada are really shoddy—goods of an inferior character against which we ought to legislate; and it is alleged that any increase which we might make on woolen duties would have the effect, not of shutting out the purer woolen goods, but the shoddy goods. That is argued with much force, and I am inclined to believe that there is something in it. However, we propose to deal with the matter in this way. Our present duty on the class of goods which I may describe as cloths, tweeds, overcoatings, and goods of that character, is 35 per cent., subject to the preference, which brings the duty on British goods down to 23 1/3 per cent.

We do not propose to increase the general tariff; but we propose to fix a limit on the extent to which the preference shall apply to these goods. We propose to fix a minimum tariff of 30 per cent. on this class of goods coming under the preferential tariff. This change will apply to all woolen goods mentioned in the tariff item 394, with the exception of blankets, flannels, bed comforters and counterpanes, which are placed in a group by themselves.

This is simply the tardy recognition by the Canadian Government that a 23 1/3 per cent. duty on woolens means the wholesale importation of shoddy goods. The addition of 6 2/3 per cent. makes the preferential rate 30 per cent., or 5 per cent. less than the regular duty. This is practically the abolition of preference to British woolen goods, but, if the experience of the United States is a fair guide, will fall far short of protecting the Canadian manufacturers. The Wilson bill imposed an ad valorem duty of 40 per cent. on goods worth less than 40 cents per pound and failed utterly to keep out the worthless rubbish in the manufacture of which England excels. The combination of ad valorem and specific duties in the Dingley bill accomplished the object perfectly. Take for example the Yorkshire 20-ounce 32-cent cloth described in our May issue. In order to reduce cost by an increase of production the Yorkshire manufacturer would gladly sell this cloth in America for cost or even less. Assuming the cost in England to be 30 cents per yard we find the cost in Canada to be as follows:

Old preferential rate:	
Cost in England	30 cents
Duty, 23 1/3 per cent. ...	7 cents
Total	37 cents
New preferential rate:	
Cost in England	30 cents
Duty, 30 per cent.	9 cents
Total	39 cents

After acknowledging that the 23 1/3 per cent. barrier against English shoddy goods is a failure, the Canadian Government tacks on 6 2/3 per cent., which means only 2 cents per yard on the fabric in question. This is no more than the English manufacturer would willingly sacrifice in order to gain the Canadian market.

Compare this niggardly doling out of protection to a ruined industry with the substantial protection afforded by the Dingley bill on the same shoddy fabric:

Cost in England	30 cents
Duty, 1¼ lbs. 33c. $.41¼ 50%	.15
	56¼ cents
Cost in the United States	86¼ cents

Such a schedule is equivalent to simply prohibiting the importation of the rubbish that is now ruining the Canadian woolen industry.

Batiste was first made in Flanders in the 13th century and named for its inventor, a weaver.

The End of a Seven Year Drouth.

For seven years preceding 1904 Australia has suffered from a practically continuous drought, which has turned vast tracts of the island continent into desert land. The lack of rain has prevented or greatly restricted the raising of crops. The effect of the calamity, for it fully deserves that name, is clearly shown by the statistics of sheep raising. A large part of the sheep perished from lack of pasturage, and in some sections of the country this formerly flourishing industry has become extinct. The following statistics of the number of sheep in Australia and Tasmania have been compiled by Goldsbrough, Mort & Co., Melbourne.

STATE.	1881.	1891.	1901.	1903.
New South Wales	36,591,946	61,831,416	41,857,099	26,649,124
Victoria	10,267,265	12,928,148	10,841,790	10,841,790
Queensland	8,292,883	20,289,633	10,030,961	7,213,985
South Australia	6,810,856	7,745,541	5,060,540	4,922,662
Western Australia	1,267,912	1,962,212	2,625,855	2,697,897
Total in Australia	63,230,862	104,756,950	70,416,255	52,325,758
Tasmania	1,847,479	1,662,801	1,792,481	1,679,518

Under favorable climatic conditions the Australian flocks, numbering 63,000,000 sheep in 1881, rose to 105,000,000 in 1891. The recent drought began during the latter part of the succeeding decade, at the end of which, in 1901, the number of sheep had fallen to 70,000,000. The losses were especially heavy in 1901-02, reducing the total to 52,000,000, just one half the number in 1891, eleven years before.

During the past summer, which corresponds to our winter, the rainfall has been heavy, and under its effects the fields have again grown green, pasturage has been excellent and the Australian farmers have been cheered with the hope that at last the drought is at an end. The reaction from the former discouragement has led in some quarters to a more optimistic feeling than is apparently warranted by the facts. Thus the Premier of New South Wales stated in February that the number of sheep in New South Wales, which he estimated at 30,000,000, was likely to increase 15,000,000 during the ensuing year, bringing the total for that State up to 45,000,000. He not only failed to take into account the uncertainty of the Australian rainfall, but also the fact that such an increase as he predicted has never occurred even under favorable conditions. The Sydney Morning Herald pointed out that the greatest increase in the number of sheep in any one year since 1880 was from 31,660,000 in 1884 to 37,820,000 in 1885, the total of 46,965,000 being reached in 1887, thus requiring three favorable years to accomplish what the Premier predicted for the coming year.

Cotton Goods in the Philippines.

The December, 1903, report of cotton goods imported into the Philippines, just issued, is very discouraging, the United States being the tail ender on the list, which is as follows:

Great Britain	52.26 per cent.
Spain	10.42 per cent.
Switzerland	8.81 per cent.
British E. I.	7.53 per cent.
Germany	7.11 per cent.
Japan	5.20 per cent.
France	3.16 per cent.
United States	2.52 per cent.
Other	2.99 per cent.

The imports for January, 1904, show little, if any, improvement, and are as follows:

Great Britain	44.62
Spain	17.62
Switzerland	8.49
Germany	7.56
British E. I.	6.36
United States	5.01
France	2.7
Others	7.64

It is believed that the first jenny and stock card made in the United States were built at Bridgewater in 1786, by Thomas Somers, an English midshipman.

American Cotton and European Wages.

It is estimated that the 78,000,000 cotton spindles of Europe are running at not more than two-thirds of their capacity. This curtailment is equivalent to the complete stoppage of 26,000,000 spindles, or as many as are in the United States, Canada and Mexico. In the cotton mills of the United States there is one operative for every sixty-two spindles. In Europe the number of operatives is much larger. At a conservative estimate the short time in European mills, caused by the scarcity of American cotton, is causing 1,250,000 operatives to remain idle for two-thirds of their usual working time.

This loss of work means starvation, disease and death to many and suffering to all the people directly or indirectly dependent on the wages paid in the cotton mills of Europe. The situation cannot be realized in the United States where the stopping of mills, to a like extent, serious though it may be, causes trifling privation compared with a like condition in Europe. At the recent Cotton Congress at Zurich the condition of the working people was discussed in private conversation and the following report by the Manchester Guardian of a discussion by a group of English and Continental delegates shows how desperate must be the situation among the Continental workers:

Continental delegate: "You pay them for a full week although they work only 40 hours?"

English delegate: "No, we pay them only for the hours they work."

Continental: "Can they live on these reduced wages?"

English: "Short time makes it necessary for them to exercise the severest economy, but with much self-denial it provides a bare living and compels no recourse to charity."

Continental: "Our people are so poorly paid that they could not live if one-third of their usual income was taken away from them. There lies the chief difficulty in the way of short time on the Continent."

In spite of the difference in race, language, government and social institutions the people of the whole world are bound together by common interests and the ravages of the boll weevil in Texas or the disposition of the negro to leave the cotton fields of the South, means loss of work and untold suffering to the working-people of over-populated Europe. Wages are so low there that the soul and body of the European worker is held together by a very slender tie. A slight disturbance of the industrial system brings them face to face with starvation. The difficulty in the cotton industry is that too many are spinning and weaving cotton in Europe and too few are raising it in our Southern states. There is an over supply of workers in the cotton mills and a scarcity of workers in the cotton fields. The labor supply is unequally distributed.

During the past few years cotton manufacturing in Italy has undergone a phenomenal development, due to the utilization of the water power from the melting glaciers of the Alps and to the supply of cheap labor obtained from the teeming population of Italy. Twelve years ago there were practically no cotton goods made in Italy. According to a recent official report there are at present 2,111,170 spindles and 78,306 looms in the Italian cotton mills, in which 135,198 persons were employed, divided as follows:

Men	34,738
Women	82,932
Children under 15 years	17,528

Of the total number of operatives 12.3 per cent. were children under 15 years, as compared with 7 3/4 per cent. in our Northern mills and 25 per cent. under 16 years in our Southern mills.

Astonishingly low wages are paid. The average for the men is 41 cents; for the women 32 cents; and for the children 19 1/2 cents per day. Four-fifths of the cotton used comes from the United States, and the other fifth from India and Egypt.

A striking feature of the Italian exhibit is the large number of operatives as compared with the machinery operated. 135,198 Italian

hands run but 2,111,170 spindles, or 16 spindles per operative.

The present straits of the cotton industry throughout the world show that this development of the Italian resources was misdirected; that what the world needed was not more spinners and weavers, but more cultivators of cotton; that the 135,000 industrious, frugal, and poorly-paid Italians who have entered the cotton mills of Italy during the past twelve years would have been far better off now and have contributed more to the sum of human happiness if they had turned their backs on the mill and engaged in the cultivation of cotton in America. It would have been impossible for any one to convince them of this truth during the past twelve years. They wanted work and found it at their doors. To accept it was to move along the line of least resistance. It is only the logic of events that can change such a misdirection of energy.

The present deadlock in the cotton industry points to a remedy. It does not lie in the subsidizing of railroads in Togo, nor in the encouragement of cotton cultivation in other unfavorable climates. It will be found by directing the industrious and law abiding people of Europe from the mills to the cotton fields of America. The experience of the past half century teaches that the efforts to find a new supply of cotton to compete with the American crop are doomed to failure. As long as the axis of the earth remains where it is and its inclination to the plane of the ecliptic is unchanged, the world must look to America for its cotton. The sooner this fact is recognized the better.

Swiss Mills.

According to Leipziger Monatschrift fuer Textil-Industrie the weaving of silk bolting cloth is a specialty in many Swiss mills. In the canton Appenzell 1,417 hand looms are run on this grade of cloth. The wages of the weavers vary from $120 to $330 per year. From these figures must be deducted the various expenses such as drawing-in, winding, etc., which are paid by the hand weaver and which vary from $20 to $40 per year.

Advertising Textile Goods.

In our news item is a report that the York Hosiery Mills are being operated over time to meet the big demand for their goods. There is more than a coincidence between this fact and the fact that this company has recently inaugurated an advertising campaign in such journals as the Delineator and Ladies' Home Journal, and are creating a demand for their product among the consumers.

Imports of Wool.

Despite the dullness in wool manufacturing the imports of wool in May reached 17,779,750 lbs., as compared with 146,266,614 lbs. in the same month last year. Nearly 43 per cent. of the May, 1904, imports consisted of so-called carpet wool. The wool imports for the 11 months ending May, 1904, amounted to 157,696,440 lbs., valued at 14 1/4 cents per pound, to which the duty must be added. Estimating the June imports at the monthly average for the preceding 11 months the total imports of wool for the year just closed reach 172,032,480 lbs. To this should be added 53,687,226 lbs., the grease wool equivalent of the woolen goods imported in the same 12 months, making 225,719,706 lbs. grease wool imported for the past year. Practically all of the wool imported is of the light shrinking grades. Allowing for an average shrinkage of 30 per cent., the above weight of grease wool would yield 158,003,794 lbs. of scoured wool. It is estimated that the domestic clip yields 125,000,000 lbs. of scoured wool. On this basis the yearly total of both imported and home grown wool is 283,003,794 lbs., scoured weight, or 56 ounces per capita of the population, of which 31 ounces is imported in the raw or manufactured state, while 25 ounces grows on domestic sheep.

Until 1799, the year in which chlorine was invented, the bleaching of cotton cloth had to be performed in summer in the open air. The operations continued for several months and were expensive, arduous and tedious.

Textile Machinery in the United States.

Rated by the number of employees textile manufacturing in 1900 was the leading industry in the United States. No signs of decadence can be found in the statistics of textile machinery, compiled from the 1904 edition of the Annual Official Directory of the Textile Industries compiled by the Textile World Record, which has recently been issued. Prosperity and a healthy development are indicated in every branch. Protected from the evil of foreign competition, the textile industry is growing to meet the increasing demand of the people for goods at American prices.

COTTON SPINDLES.

States	1903	1904	Increase
New England....	14,173,867	14,626,557	452,690
Middle.....	1,921,460	1,749,024	*172,436
Southern.....	7,720,677	8,086,674	365,997
Western	338,852	334,126	*4,726
	24,154,856	24,796,381	641,525

COTTON LOOMS.

States	1903	1904	Increase
New England....	333,702	338,801	5,099
Middle.....	37,579	33,959	*3,620
Southern.....	185,271	192,307	7,036
Western	8,080	6,933	*1,147
	564,632	572,000	7,368

WOOLEN CARDS.

States	1903	1904	Increase
New England....	3,644	3,566	*78
Middle.....	2,130	2,163	33
Southern	267	248	*19
Western	652	632	*20
	6,693	6,609	*84

compared with 43 per cent. in the rest of the country. The nearly equal division of the growth shows that the predicted decline of the cotton industry in the North is not taking place. The South claimed 70 per cent. of the new spindles in the preceding year. The decline to 57 per cent. reflects the readjustment and equalization of the labor supply, which during the past twenty years has led to a phenomenal development of cotton manufacturing in the South.

The decrease in the woolen cards is probably due to the substitution of combed yarn. This theory is strengthened by the increase of 1,706 wool and worsted looms. The worsted combs show a slight increase.

The silk industry shows the large increase of 4,021 looms, three-quarters of which were installed in the Middle States.

WOOL AND WORSTED LOOMS.

States	1903	1904	Increase
New England....	40,666	42,122	1,456
Middle States....	34,779	34,647	*132
Southern	3,092	3,367	275
Western	4,760	4,867	107
	83,297	85,003	1,706

WORSTED COMBS.

States	1903	1904	Increase
New England.....	865	906	41
Middle States.....	721	690	*31
Southern.....	7	7	0
Western.....	29	28	*1
	1,622	1,631	9

SILK LOOMS.

States	1903	1904	Increase
New England....	5,040	5,769	729
Middle.....	55,124	58,223	3,029
Southern.....	1,775	1,775	....
Western	493	686	196
	62,432	66,453	4,021

Amounts marked with a (*) signifies a decrease.

COMPARISON OF TEXTILE MACHINERY IN 1904 WITH 1903.

Amounts marked with a (*) signifies a decrease.

	1903	1904	Increase	Per cent
Cotton Spindles.....	24,154,856	24,796,381	641,525	2.6
Cotton Looms	564,632	572,000	7,368	1.3
Woolen Cards	6,693	6,609	*84	*1.1
Wool and Worsted Looms	88,532	85,003	1,706	1.9
Worsted Combs.....	1,612	1,631	9	.5
Silk Looms.....	62,432	66,453	4,021	6.4

An increase of 641,525 cotton spindles during the past year brings the total to nearly 25,000,000, or nearly one-quarter of the total for the whole world. 57 per cent. of the year's increase took place in the South, as worsted and cotton yarn for carded woolen

French Worsted Spinning.

X.

BY A FRENCH TEXTILE ENGINEER.

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WOOL SCOURING.

After leaving the desuinting machine the wool drops into the first bowl of the scouring machine, Fig. 36, which consists of four bowls, placed one in front of the other. The first bowl is filled with a warm solution of acid. The wool is seized by the forks, S S, Figs. 37, 38, 39 and 40, which carry it forward to the delivery end of the machine. These forks also serve to agitate the stock in the bath and cause the scouring liquor to penetrate the locks of wool, many of which, at this stage, are likely to be compact. Generally there are two pairs of forks for each bowl, making eight pairs in all. These forks are moved alternately forward in the liquor and backward in the air, as shown at Figs. 39 and 40, from which the mechanism will be understood without further explanation.

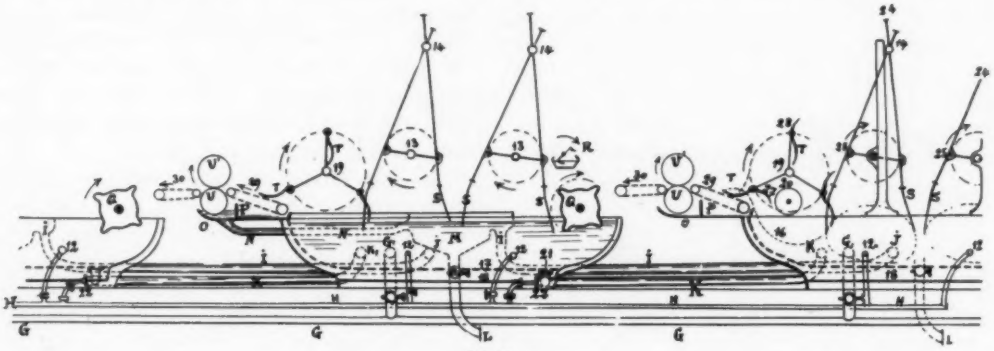


Fig. 37

Two forks are mounted together and while one is passing backward in the air, the other is moving forward in the liquor. This arrangement maintains a continuous motion of the wool. The forks are adjusted so that the points will pass close to the bottom of the tub and thus carry forward the wool that may be lying there.

Besides the two pair of forks already described there is at the delivery end of each bowl a third system of forks, T T T, Figs. 41 and 42, suspended freely upon the axes, 28. The action of this third fork is similar to that of the hand, if one should carry the wool in the liquor forward by passing the hand backward and forward in the liquor. Each of the forks, 27, is suspended freely on an axis, and because of its weight maintains a perpendicular position until it reaches the lower part of its journey, when the upper part of the fork is brought in contact with the face of the pulley, 20, and is tipped down, bringing the lower end up and thus raising the wool to the apron. As soon as the forks have passed the pulley, the former is left free and resumes a perpendicular position as shown in the illustration.

Fig. 42 represents the successive positions of the forks and explains the method of operation. They carry the wool from the preceding fork to the endless apron, 29, which in turn delivers it to the squeeze rolls, U U', where the liquor is extracted from the wool by a very high pressure, amounting to sometimes five tons. From these squeeze rolls the wool passes in a nearly dry state to the endless apron, 30, which delivers it to the succeeding bowl, in which the operations that were carried on in the first bowl are repeated.

The third fork is the same in each bowl and the movement is shown at Fig. 37. The end-

less apron, 29, is made with iron slats and moves at the rate of about 18 feet per minute. The water dropping from the wool to the table passes to a plate, P, by which it is carried back to the bowl from which it came. This is shown clearly at Fig. 43. This liquor is carried back to about the centre of the bowl, 32, so as to effect a thorough mixture with the liquor already there.

scouring bowl, as this would cause the liquor in the bowl to become dirty very quickly and necessitate frequent renewals during the day. Under each pair of squeeze rolls is a small reservoir, o, Figs. 37, 38, and 43, into which the water from the rolls runs. From this reservoir it passes through a pipe, N N, I I, through the exit, J, into the preceding bowl. Thus the liquor of one bowl is replenished by

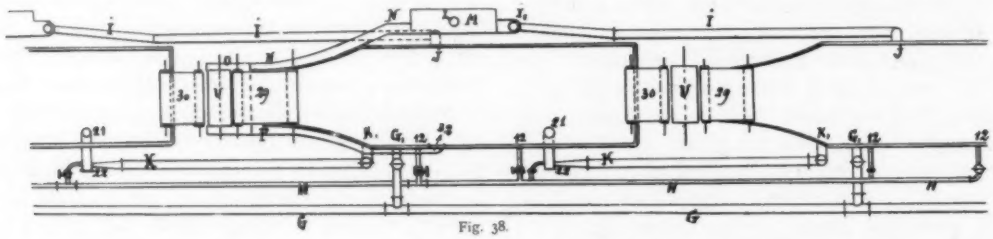


Fig. 38.

As already explained, the squeeze rolls are placed between the successive bowls and are necessary in order thoroughly to cleanse the wool. Without them this scouring liquor of the fourth bowl would be nearly as dirty as that of the first bowl, and the wool would be improperly scoured. These rolls are made very large in order to get the strength necessary to resist the enormous pressure under

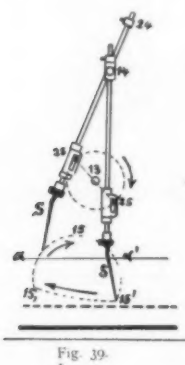


Fig. 39.

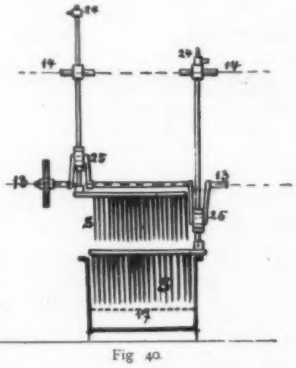


Fig 40.

which they are brought. The diameter of the lower one, which is not covered, is about 12 inches; that of the upper one, which is usually covered with cotton twine or other elastic material, is about 18 inches.

The liquor extracted from the wool by the squeeze rolls is necessarily dirtier than that in the bowl from which the wool has just come. For this reason it will not answer to let the liquor from the squeeze rolls run into this

the purer liquor from the rolls of the next bowl. The reservoir, N, is set in this first pipe to allow the dirt and heavy material in the liquor to settle. This sediment is removed from the reservoir when necessary by means of a valve, L, placed in the bottom. A screen prevents any particles of wool that may have been brought along with the liquor from passing through this valve.

Fig. 44 shows a cross section of the squeeze rolls. The lower roll is driven by a pair of gears not shown in the plan. The upper roll is connected with the lower roll by the gears, u u', and is also driven by the friction of the lower roll. The upper gear, u', is not fastened to the upper roll, but is connected with it by means of four clutches, B B B B, which are fastened to the gear and connect with the ratchet, r, fastened to the shaft of the upper roll. The sizes of the gears, u u', are so adjusted that the resulting speed of the upper roll is 6 per cent. slower than the speed at which the upper roll is driven by friction with the lower roll. As a consequence when the rolls are started the gear, u', falls behind the upper roll, U', the latter being driven faster by friction with the lower roll. If a large bunch of wool should accidentally pass between the rolls the friction would fail to drive the upper roll. As soon as the upper roll stops the clutches, B B B B, of the gear, u', which is moving positively at a constant speed, connects with the ratchet, r, and this turns the roll, U',

which has been stopped because of the failure of the frictional drive. Thus the upper roll cannot be permanently stopped by any interruption of the friction with the lower roll. As soon as the friction is restored the upper roll begins to move faster than it is driven by the clutches and ratchet, which are thus thrown out of play until another interruption of the friction occurs. This combination of frictional and positive drive enables the speed of the rolls to adjust itself to the constant variations in the thickness of the layer of wool passing between the rollers.

about 32 inches; including the wings, about 50 inches. As its name indicates, the object of this immersion drum is to immerse the wool in the liquor as soon as it drops into the bowl. The nearly dry wool drops from the apron, 30, to the immersion drum, Q, and is immediately pressed into the liquor. The liquor is heated by two steam jets from the pipes, 12, and which can be regulated by the valves at Fig. 38. The workman determines the temperature by testing with a thermometer and regulates the supply of steam accordingly.

(To be continued.)

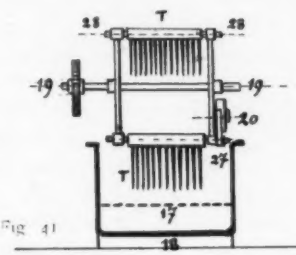


Fig. 41

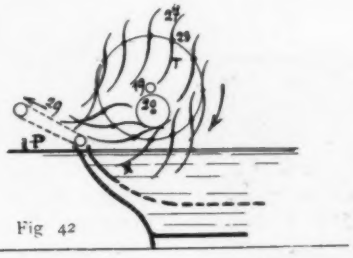


Fig. 42

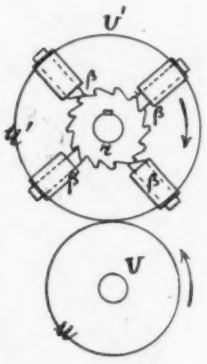


Fig. 44

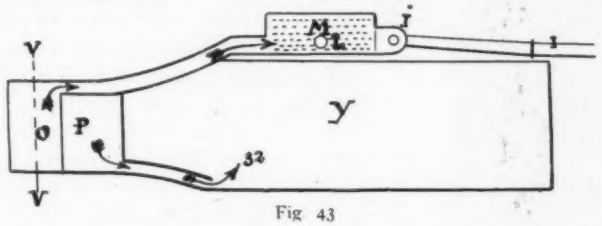


Fig. 43

Each of the bowls has a double bottom, the regular or lower bottom, 18, and an upper or perforated false bottom, 17, placed about 6 inches above the lower one. This perforated bottom prevents the wool from passing below it, but allows the free passage of earthy and other heavy materials which settle on the lower bottom and which are removed when the machine is cleaned. As a result of this deposit of earthy and other foreign matter below the false bottom, much less soap and water are required than if the false bottom were not used.

Each bowl has an immersion drum, Q, which is hollow and made of copper with four wings. The lower part is partially immersed in the liquor. It reaches across the full width of the bowl and makes about four revolutions per minute. The diameter of the drum is

Center Selvage Motion. The Needle Loom Company, Coventry, Eng., are introducing into England a center selvage motion which was invented in France and has been used successfully on the silk looms of St. Etienne. The apparatus has been improved and simplified and is said to give good results on cotton looms in Lancashire.

In 1662 a patent was obtained by Messrs. Jones and Palmer in England for "the misterie, arte, way and means of makinge hard and softe soape without the use of anie fire in the boyling or makinge thereof."

Marseilles or castile soap was so called from its being first manufactured in Marseilles, France.

The Mills of Chestnut Hill.

THE STORY OF A CONNECTICUT VILLAGE.

BY JAMES N. TUCKER.

(Continued from April.)

Afterwards a stock company, consisting of Lemuel Elliott, Albert T. Elliott and Welcome Bartlett, succeeded to the control of the property. This corporation was known as the Elliottville Manufacturing Company. Mr. Bartlett was the active representative of the company here. He had previously been superintendent for a number of years. He was born in Cumberland, Rhode Island, near Woonsocket, Dec. 8, 1815. In early life he worked in the various mills in Woonsocket, and came here in 1846. No one can recall Mr. Bartlett except with the most pleasant memories. He was in many respects a model. Earnest, faithful and diligent in business, he yet found time for the development and use of the higher faculties of the soul. Tenderly and as with a mother's care he ministered to the needs of his employees. One of these recently said to me, "He was as a father to us all." After a lingering illness and terrible suffering, the result, as was supposed, of lifting some heavy machinery, he passed away Feb. 24, 1875.

WELCOME BARTLETT.

After the formation of the company they continued to operate the mill for many years, and the property next below on the stream, which had originally been Squire Tom Durfee's axe and hoe shop, and afterwards a saw and grain mill, machine and blacksmith shop, was added and fitted up with cotton machinery. This part of the property then became known as the Peep Toad mill. For many years they continued to manufacture cloth, but afterward James P. Kendall came here from the South and began the manufacture of yarn. Later Willis Bartlett, son of the former superintendent, ran it as a yarn mill. The mill as run by Pray & Angell contained 30 looms, but this number was finally increased to more than 100. It is a building 40 by 75 feet with four floors, with a wing 40 by 50 feet, also with four floors. Its present owner is T. E. Hopkins of Danielson.

Soon after the building of the Elliottville mill, Capt. Asa Alexander, who besides carrying around a military title seems to have been a master-builder in the line of cotton mills, built another mill of wood, about midway between Elliottville and the Leffingwell mill. This mill had 60 looms and, for a time, was operated by William Starkweather, and afterward by Tenney & Cowles, of Boston, and was burned in 1847. It was rebuilt in 1850. In 1851 John L. Himes, who was born in Exeter, R. I., in 1812, and had received a practical education in the mills of Rhode Island, hired a mill in Apponaug, in that state, but, before starting, gave it up and moved the machinery intended for that mill to this place and set it up in the mill just built by Alexander. He started in with 32 looms. After a few years financial difficulties overtook him, Westcott and Pray came to his assistance,

stocked the mill and continued it under the supervision of Himes until about 1860. Himes then became the owner again, and

THE PEEP TOAD MILL.

prospered finely for a time. He finally ran in debt in order to enlarge the mill, at the flood tide of prosperity, when, the tide suddenly receding, left him stranded. This was much to the regret of the many friends of Mr. Himes, as he had been a hard working, industrious man, and, at one time, could have sold out and retired with an ample fortune.

During the Himes administration the property was kept in good condition and its capacity increased to 100 looms. In 1879 the mill was bought by Edward H. Robinson of

THE HIMES MILL.

Providence, son of William A. Robinson of the Valley Mill. He operated the mill for a number of years, under the supervision of

Albert W. Greenslit, adding steam power and making many improvements, and in the early 90s the mill was sold to Charles D. Chase, the present proprietor, and was by him fitted up as a woolen mill with first class machinery. It is now being run by Fred R. Smith, formerly of Worcester, Mass., and is doing a prosperous business, adding greatly to the prosperity of our village. Mr. Chase is superintendent. The mill is now a fine stone building, 50 by 160 feet, with a brick annex 30 by 40 feet.

In 1834 Reuben Bartlett became infected with the spirit of the times and erected a small mill, near where is now the middle of the Chestnut Hill, or Ross mill pond. In company with him was his son, Waldo Bartlett, and at first they made carpet and stocking yarn. In 1837 they put in a dresser and made satinet warp. In 1840 they put in a pair of mules and twelve looms, and began the manufacture of cotton cloth. In 1842 they sold to Westcott and Pray, who put in four more looms and continued the business until 1846, when the privilege was merged with the one below, where the little woolen mill had formerly stood. Here, very near to the site of the woolen mill, Westcott and Pray erected the Chestnut Hill Mill, otherwise and more recently known as the Ross Mill. This mill is of stone and was originally 36 by 100 feet and four stories in height, but there have been subsequent additions of two wings, one of which is 37 by 49 feet, and the other 36 by 40 feet, and each two stories high. The mill was sold to John D. Burgess of Providence Dec. 28, 1849. The mill was operated by him until Nov. 19, 1856, when it was sold to Mayhew, Miller and Co. of Baltimore, Md., and leased to Westcott and Pray, who ran it until 1859, when it was taken by Mayhew Miller, a son of one of the proprietors, who, in company with Frank King of Boston, continued the business for ten years. The property then again came into the hands of Thomas Pray, in 1869, just previous to his death, and was operated by his son, Thomas Pray, Jr., until 1874.

The younger Pray made many improvements, enlarged the mill, added to the water power, built a number of new tenement houses, a large boarding house, etc. In 1874 the mill was bought by John L. Ross of Pawtucket, R. I. Mr. Ross, although well advanced in years, exhibited much energy in the work and retained the property until 1899, when it was purchased by A. G. Bishop of New York, who conducted it for a few years. It is not now in operation. It is located about 500 feet above the Young's Mill, at the head of the water power of the stream and is a desirable property. It is equipped with a few more than 100 looms.

THE HIMES MILL POND.

The last mill built on the Whetstone was the Whitestone, built of stone by Westcott and Pray, in 1858, near the site of the Leffingwell mill, which was burned in 1855. It was built for 156 looms and is 50 by 160 feet, with four stories, and a two-story extension 50 feet long. Westcott and Pray made a profitable run for many years, but, Oct. 2, 1865, sold to Jedediah Leavens, of Norwich, the former partner of Calvin Leffingwell, who, with others, formed a corporation having headquarters in Norwich and known as the Whitestone Company, a corruption of the

original name of the stream. This corporation operated the mill continuously for more than twenty-five years under the management of Kirk H. and Francis J. Leavens, sons of Jedediah. Under their direction the plant was very much improved and its productive capacity greatly enlarged. They were, for a long time, fairly prosperous, and distributed hundreds of thousands of dollars among the wage earners of our village; but, as faded away the small manufacturers from all New England, so faded away this once strong corporation, and the mill is now silent and the property of the heirs of Henry Westcott.

THE WHITESTONE MILL.

This sketch has briefly and of necessity somewhat prosaically related, the history of the inception, growth and decline of the industries along the valley of the Whetstone. The principal actors have passed from life's stage and the scene of their activities. Men and events are remembered by us according as they become more or less intimately and completely a part and parcel of our own lives. Many of those who, at various times, have been actors in the work which we have described, were but transient figures upon the panoramic screen, and their memories have faded. Perhaps in this sketch some have been entirely forgotten. They were here only for a little time, seen only occasionally, in no way became personally identified with our home or village life, and passed off the stage unnoticed. Others came to stay. They married daughters of our kinsmen and reared boys and girls who attended our village school, and in time became the fathers and mothers of another generation.

Among those whose names will survive and whose memories will be kept green and fragrant through many coming years were, Ebenezer Young, the courteous Judge and Hon. M. C.; Henry Westcott of genial countenance and pleasant and engaging manner; Thomas Pray of sterner mien, but of kindly heart, "Super." John White, the sturdy old Democrat of explosive vocabulary, the memory of whose cumulative laughter even now stirs the auricular nerve; John L. Himes, with his ready wit and bluff salutation, and his son Albert with his squibs and jokes and fun galore; Major Calvin Leffingwell, with a heart as big as his stories; John B. Truesdell and brother Henry, stern devotees of rectitude and fair dealing; Norris G. Lippitt, the bright intellectual star; Welcome Bartlett, a grander combination of the successful business man and the Christian philanthropist than the world often sees.

These men spent much of their lives here. All were influential townsmen, interested in

politics, education and religion. They were the soul of our activities. Our village life throbbed with their energies. They furnished employment to the industrious, and from their substance gave alms to the poor and needy. They often tenderly cared for the sick and consoled the broken hearted. Most of them have passed away, but "their works do follow them." Their lives touched us all, and we shall be better because of them. Of the above only two remain, Henry Truesdell, now in Packersville, Conn., and Albert H. Himes, in Providence.

ALBERT W. GREENSLIT.

These biographical allusions would not be complete without reference to the sole resident survivor of the Chestnut Hill industrial period, the connecting link between the past and the present, Albert W. Greenslit, whose name has been mentioned in these pages as superintendent of the various Robinson properties. Albert W. Greenslit was born Dec. 21, 1827, in the town of Hampton, Conn., of good old Puritan stock. He received his education in the schools of that town and entered the arena of life in early years, strong, independent, self reliant and self supporting. He came here in 1847. He had previously worked in the small mills in his native town, and immediately found employment here, at first in the Leffingwell mill, and afterward in some of the other mills until 1852, when he began work in the weave room of W. A. Robinson, of which he retained charge until at the death of superintendent John B. Truesdell in 1863, he became superintendent of the W. A. Robinson mill, and, afterward, of the Himes mill, after its purchase by Edward H. Robinson. He retired in 1890. having been for thirty-eight consecutive years in the service of the Robinsons, and always performing the duties of his position in a manner eminently satisfactory to employer and employes. He was well equipped for his work. In the prime of life, active, energetic, tactful, with an extraordinary knowledge of human nature, he was enabled to rule successfully and without friction where others would have failed. A strong man intellectually and inheriting a large religious and moral sense, he became identified with all village interests and a pillar in church and community affairs. He has often been sought by his fellow citizens to fill official positions of trust and honor and, in 1876, represented the town in the legislature. Now, at the age of seventy-six, there is none whom it gives our people greater delight to honor.

Coincident with the growth of the mills, and necessitated thereby, was the growth of the reservoir system. In 1828, upon the petition of Ebenezer Young, Capt. Asa Alexander and others, the Chestnut Hill Reservoir Company was incorporated by act of the General Assembly. This charter was renewed in 1831. At that time Judge Young owned all the water rights pertaining to the Burgess saw mill, at the outlet of Lake Chaubaumaug, having acquired them a short time previously, and also owned adjoining land to the amount of 450 acres, some of which was afterward included in the "middle" reservoir, which was built some years later, and occupied the cedar swamp, mentioned early in this article.

By deed, dated Aug. 1, 1831, Young con-

veyed all water rights to the Reservoir company and also five acres of land, near the present dam at the lake, which was constructed in 1832. This greatly increased the storage capacity of the lake and added much to the value of the mill properties.

In the same year the company proceeded to buy control of the Bartlett saw mill pond, just above the Rapids, and flowed a part of the bog meadow flats, just east from the present village. These rights were further enlarged by purchases from Reuben Bartlett, in 1836.

In the latter year the company completed the purchase of land for the middle reservoir, which was to occupy the aforesaid cedar swamp, and in 1837, the dam was constructed exactly on the road bed of the old Hartford and Providence turnpike, shares in which had been purchased by the company.

In 1849 the bog meadow reservoir was raised two feet, and to its present proportions.

In 1854 the company purchased land of Eddy and Nancy Pray and Paris M. Law, built a dam and flowed a large tract, just below Bateman pond, and northwesterly from the lake. This dam gave way in May, 1865, carrying disaster to the mill property along the stream. The damage, however, was speedily repaired and the dam rebuilt, and since then has withstood every attack of flood and freshet.

In 1872 land was secured from Alvia Chase and others and a dam was built across an affluent of the middle reservoir creating what has been known as the Alvia reservoir,

THE ROSS MILL.

which has proved to be a valuable adjunct to the reservoir system. It must also be stated in this connection that the mills, during their successful operation, were kept well abreast of modern progress in the utilization of power. The old fashioned wooden "breast"-wheels with which they were originally equipped, in due time gave place to the modern turbine, and the water power has been supplemented by steam power, which has been added to every mill without any exception.

These reservoirs drain an extensive water shed which, because of its precipitous declivities, promptly and actively responds to every rainfall and, consequently, the amount of water power available is far in excess of

what is apparent at first glance. The present size and capacity of the various reservoirs is as follows:

The Lake, 140 acres, 457,380,000 gallons.

Eddy Pray reservoir, 98 acres, 160,083,000 gallons.

Middle reservoir, 200 acres, 261,360,000 gallons.

Alvia Chase reservoir, 62 acres, 101,277,000 gallons.

Bog meadow reservoir, 55 acres, 71,874,000 gallons.

The system is still capable of much greater enlargement by a long talked of canal, intended to connect the lake with an extensive and active water shed, just to the eastward, over the Rhode Island line. A dam 15 feet high at the narrows, southeast from the village, extending from the promontory to the south shore, and receiving the accession from the Rhode Island water shed via. the lake, would flow out all existing reservoirs excepting the lake, and would make a reservoir two and a half miles long and a mile wide.

The Chestnut Hill Reservoir Company obtained a new charter from the General Assembly of 1901, giving greatly enlarged powers, and have since been digesting various plans for enhancing and utilizing the water power of the stream.

My story is nearly ended yet how incomplete. Would that I could breathe into it the breath of life that it might become a living soul, epitomizing the events, the life, the vim, vigor and energy of those stalwart years of Chestnut Hill industry. The resultant change from the old order of things was one of gradual and healthful growth, rather than of sudden revolution, but it was a change from monotonous humdrum to healthful variety. At first the mills absorbed the surplus labor from the farms. The boys and girls worked a part of the year, at least, in the mills. Wages increased, bank accounts were started and grew and the foundations of fortunes were laid.

Then, as the mills grew, help became scarce, and the surrounding towns were drawn upon. Population increased and an era of building set in. Real estate advanced in value. Stores were started and a home market was realized. A social revolution set in Intercommunication with adjoining towns brought a commingling of manners and thought, mutually beneficial. The horizon broadened. Schools were built and educational privileges increased. An aggregation of so many individuals demanded new churches.

In 1836 the Baptist church on the hill was built. Of this church Westcott and Pray were the chief promoters, both being members and Westcott, who was a fine singer with a smooth tenor voice, was for many years leader of the choir. In 1851 the Free Baptist church in the valley was built, and was largely contributed to by the Robinsons, Leffingwell, the Truesdells, Lippitt, Bartlett, Greenslit, Himes and others. Political life was infused with the new blood, and many were the hard fought campaigns.

Then came all the concomitants of New England prosperity. Social events, afternoon tea parties and evening entertainments. Independence day celebrations and summer time picnics, sleigh rides, coasting and skating parties, popular debates in the lyceum, spelling matches in the school house, singing schools, church festivals and country dances for the long winter evenings.

Incipient Barnums and Baileys with their "greatest show on earth," with the instinct of their profession found us and traveling ventriloquists cast their weird voices at us from unexpected corners, while sleight-of-hand performers cooked eggs in old men's silk hats and pounded watches into glazial hash in gunny bags, and then produced them as good as new to our wondering eyes, or swallowed swords and jackknives and reeled countless yards of ribbon from their gastronomical department.

The patent medicine man came to minister to our ills and, with glib tongue and flaming torch, held forth upon the village green and raked in our hard earned shekels. The merry-go-round took us in to its circuit and gave the children a week of delight. The Yankee notion man sold his wares from door to door, and the Jew-peddler from New York arranged his monthly schedule to fit the pay day at the mills. Even the hand organ monkey danced in satisfied glee. Everybody and everything came to us except that modern

industrial excrescence, the walking delegate. For him we had no use as we were all prosperous, contented and happy and the relations existing between our little squads of capital and labor were of the most pleasant and fraternal character.

Meanwhile our mills boomed along their prosperous way, producing not only millions of yards of cotton cloth, but also a crop of men and women destined to make their mark in larger fields, with better opportunities. Perhaps no hamlet, of like size, has equally diffused its influence through the industrial life of New England. Here were graduated those who have become agents, superintendents and overseers in many of the large mills in Maine, New Hampshire, Massachusetts, and

THE OLD CHURCH ON THE HILL.

Rhode Island. A church full of these met here last summer, on July 23rd and exchanged fraternal greetings, indulged in speech making and a big clam dinner, and organized an association which will hereafter hold an annual old home gathering here.

Besides these, many formerly employed in the mills here have entered other employments and professions and have been eminently successful. Among these are scores of very successful school teachers, whose first money to pay for a higher education was earned here. Some have become eminent as lawyers and physicians, and others as clergymen. Some have succeeded in mercantile life. Hon. Nelson W. Aldrich, Rhode Island's able senator and a leader in the upper house of congress, spent his boyhood here, worked in these mills, attended our schools, clerked in the village store, went to Providence, entered a retail store, then a wholesale house in which he became a partner. He exhibited brilliant qualities as a debater in the Franklin Lyceum, was elected to the city government, the legislature, then the lower house of congress and, finally, to the United States senate.

Hon. William S. Knox, who represented the Lawrence district in Congress, was born here, I think in the Leffingwell village, Sept. 10, 1843, and resided here a number of years.

War time came in '61 and scores of men went out from here, seized the musket and stood for "God and home and native land." Many were shot down beneath the folds of the flag for which they fought. Others languished and died in Southern prison pens. Some came home at the close of the war to engage again in the pursuits of peaceful industry.

The flood tide of Chestnut Hill prosperity was from 1850 to 1870. Then began the decline. Our little mills could not compete with larger ones, in larger places, with more favorable facilities. Our captains of industry fought bravely and well, but, one by one, the lights of prosperous industry were extinguished and now all the mills are silent except the Chase woolen mills, formerly the Himes mill, which is demonstrating the possibility of success along other lines.

What of the future?

Tell us! We all anxiously await the answer.

Has our sun set forever? or shall we again rejoice in the dawn of a brighter day, and the rising sun of a new era of prosperity.

Here are the same old hills, grand and sublime. Up their rugged sides the malarial microbe has never ascended. The typhoid germ is paralyzed and dies in our pure waters. It is true that men do die here of old age, but even then not from necessity, but often through carlessness born of long years of immunity. We invite to a residential section that is rarely rivaled.

But what of its industries? The limpid springs still cast up their bubbles to the sur-

face of the beautiful lake. The ancient stream still meanders its way across the flats and then, suddenly dashing like a race horse down the rapids, casts its silver thread along the valley. Age has not diminished its strength nor shorn it of its beauty. The mills are all of stone, with walls firm, erect and intact, each fully equipped with water and steam power. The Providence and Danielson, and Worcester and Connecticut Eastern railways, completed last year, connect their lines here and pass very near to each mill. Hourly cars run each way, making connections for all points east and west.

O, for the merry chorus of bells, sounding their morning call in unison with the harmonious voice of satisfied labor! Where is the industrial angel who shall sound the trumpet to announce the dawn of a new era which shall, even if on other lines, restore the prosperity of former years.

Meeting of the Southern Hosiery Manufacturers' Association.

The regular meeting of the Southern Hosiery Manufacturers' Association was held at Charlotte on June 14 and 15. The members met during a time of severe trial to every manufacturer of cotton goods, and the difficulties which surrounded them were doubtless what brought out the many practical suggestions for the protection of the hosiery trade.

After the meeting had been called to order by the Secretary, Garnett Andrews, of Chattanooga, Tenn., and his report had been read, Sam. A. Ashe, Jr., of Raleigh, N. C., read a paper on the present market conditions, which was illustrated by a graphic chart. The situation, past and present, was thus stated by Mr. Ashe:

The situation is such as we have not seen since 1897. I really might say since 1893. This situation is one that confronts us all, one that none of the gentlemen have ever seen before. Our position today in regard to yarn is that in 1897 2/20 started at 16 1/4, today it is 18 cents. Hosiery in 1897 started at 95 and today it is 90. The situation is one, I think, that you will never see again. Mr. Ashe here displayed a chart, showing the rise and fall in prices of cotton and hosiery.

We began business in the year 1897 when cotton was selling at 7 1/3 cents. In January, 1897, cotton went up to 8 cents, in 1898 it dropped down to about 5 1/8 cents, in 1899 it went clamoring up to 12 cents. In 1900 it dropped down to 8 cents, in 1903 it went up to 12 1/2 cents, and in 1904, in the last part of February, it went to 17 cents, then dropped to about 13 1/4 cents and again went up to 16 3/4 cents. Again it dropped back to 16 1/2 cents until June 9, 1904, then it dropped to 11:90.

Now I will give the prices as indicated in yarn. 2/20 in 1897. It began at 15 1/3 and in 1900 ran up to 23 1/4, in 1904 they raised it to almost 25 cents, then dropped again to 18 cents on June 9, 1904. Now compare comparative prices of cotton and the price of yarn. We find that they are almost the same. Now consider price of labor: The labor is taken from my own books. From the year 1897 to 1904, this month, you will find that labor ranges about 13 1/4, the year 1897 labor dropped off, labor is now about 16 3/4 and hosiery about 13 1/4. Now, gentlmen, to whom is it due? To every single one of us. We are responsible for it. We are responsible by giving jobbers the boxes they want. We are responsible by giving the jobbers the labor they want, and we are responsible by giving the jobbers the bands they want. We alone are responsible for the situation.

In the manufacture of hosiery as well as of other lines of textiles, selling goods below cost is largely due to ignorance of what the cost of goods is. It was for the purpose of correcting this evil that a committee was appointed to formulate at the Charlotte meeting a general system of cost finding. Their report appears in another part of this issue and is worthy of careful attention. It deals with one of the vital questions of manufacturing.

Another practical measure on similar lines was the plan to supply hosiery manufacturers with information regarding the prices and terms at which each one was selling his product. This was designed to prevent price cutting by reason of misinformation, often spread by buyers, concerning the selling prices of hosiery. W. H. Willard, superintendent of the Shamrock Mills, Winston, N. C., the product of which, it is said, does not compete with that of any other Southern knitting mill, was placed in charge of the

bureau, which receives and furnishes information concerning the current market values of goods. The following questions addressed to the manufacturers show the character of the information which it is desired to give to the mills:

QUESTIONS FOR MANUFACTURERS.

(1) Number and gauge of productive machines.
(2) Average daily production:
Half hose, ladies', misses'.
(3) Do you sell wholesale or retail trade—or both?
(4) Do you sell direct—manufacturer's agent—or commission house?
(5) On what terms do you sell your goods?
(6) What freight allowances do you make?
(7) Do you give any dating other than your regular terms?
(8) Do you charge for samples?
(9) Do you pay express on samples?
(10) On how small an order will you give special bands, labels, boxes and stamping?
(11) What is your minimum case to jobber and retailer? Do you ship assorted cases, if so, how many styles and dozens to a case?
(12) How many hours per week are you running now?
(13) How many hours per week did you run this time last year?
(14) What is your policy as regards accepting cancellations?
(15) Will you agree to pay $5 per year to keep up this department of the association in addition to your regular dues of $5? If so, send check to W. H. Willard, Commissioner?
(16) Will you submit prices and samples on a few of your numbers to Mr. Willard in confidence?

The election of officers resulted as follows: President, J. S. Carr, Jr., Durham, N. C.; First Vice President, Garnett Andrews, Chattanooga, Tenn.; Second Vice President, Harold Lamb, Union Point, Ga.; Secretary and Treasurer, Sam. A. Ashe, Jr., Raleigh, N. C. It was voted that in future but one meeting should be held each year, and that the next one should be held on the day following the meeting of the American Cotton Manufacturers' Association at Knoxville, Tenn. This will bring together the members of two associations having many interests in common and few if any that conflict.

The first soap manufactories in France were established in Marseilles, and its manufacture was confined to the combination of olive oil and soda until the beginning of the present century when palm oil and cocoanut oil began to be used.

A VISIT TO THE ST. LOUIS EXPOSITION.

BY A STAFF CORRESPONDENT.

The St. Louis Purchase Exposition at St. Louis is now in a fair state of completion and is in many ways a wonderful exhibition. The transportation facilities about the grounds are good, the Intramural railroad skirting a considerable portion of the enclosure. The Wabash railway have a large station just outside the main gate, while a number of trolley lines run direct to the grounds from St. Louis, 4 1/2 miles away.

The buildings devoted to mines, education, electricity and machinery form the principal feature of the Exposition. On the opposite side of the lagoon are the government, liberal arts, manufacturers and transportation buildings, with trees, lawns, lagoons, basins and cascades in the shape of a fan. The decorative interest centres at the handle of the fan at the top of the crescent-shaped hill, at which point are located the festival hall, containing the largest pipe organ in the world, the big art palace, the cascades and the cascade gardens. Except the United States Government building, which has steel trusses, and the Palace of Art, which is a brick and stone structure, all the large exhibit buildings of the Exposition are of wood and staff, and are ivory white with dashes of color in the roof. This preserves the beauty of the color scheme, while lessening the strain on the eyes.

The grounds are in the shape of a rectangle, two miles long and one mile wide. They are made up of four distinct parcels of ground aggregating 1,240 acres. The architectural beauty is indescribable and when the 120,000 electric lamps are turned on at night the scene is one long to be remembered. The illuminated cascade in the Grand Plaza is the favorite spot at night.

A number of prominent textile manufacturers have exhibits in the Manufacturers' Building, among them being Parkhill Mfg. Co., Fitchburg, Mass.; Monadnock Mills, Claremont, N. H.; Plymouth Cordage Mills, Plymouth, Mass.; Amoskeag Mfg. Co., Manchester, N. H.; Taylor Silk Mfg. Co., Paterson, N. J., who are weaving art pictures on

silk handkerchiefs; Glenwood Works, Medford, Mass.; Arlington Mills, Lawrence, Mass.; American Woolen Co., Boston, Mass.; Seymour Woolen Co., Seymour, Ind.; Charlotteville Woolen Mills, Charlotteville, Va.; Talbot Mills, North Billerica, Mass.; Sterling Mills, Ilion, N. Y.; Ballardvale Mills, Ballardvale, Mass.; Sanford Mills, Sanford, Me.; Royal Weaving Co., Pawtucket, R. I.; R. & H. Simon & Co., Union Hill, N. J.; Cardinal & Becker, Paterson, N. J.; American Velvet Co., Stonington, Conn.; Allen-Chester, Paterson, N. J.; American Hosiery Co., New Britain, Conn.; Clarence Whitman & Co., New York. The York Silk Mills of York, Pa., have two looms making broad silks. The Wayne Knitting Mills of Fort Wayne, Ind., have a loom in operation making full fashioned hosiery. Butterick Publishing Co. of New York have a fine display of their celebrated patterns and the Delineator in the Manufacturers' Building.

In the Varied Industries Building, Messrs. Platt Bros. & Co., represented in this country by Evan Arthur Leigh, have one of the most complete lines of cotton machinery that has ever been exhibited at an exposition. It is to be shown in operation, spinning from coarse counts up to 300's, but at the time of our visit it was not wholly ready, and we shall have more to say about it later.

In the Educational Palace is a very fine exhibit from the Lowell Textile School entitled a "Cycle of Color," produced by the arrangement of 148 samples of yarn made and dyed in the school. Only three dyestuffs were used. The cycle is 4 feet in diameter.

In the Machinery Building and the Electrical Palace we found a large exhibit of the Westinghouse Electric Co.; in fact in the former building the company have their plant installed for lighting the grounds, which is furnished by 12,000 H. P. engines. In the Electrical Palace the Bullock Electric Co. have a full display of their motors, etc. In the Machinery Building are located large exhibits of the following firms: General Electric Co., Buffalo Forge Co., The Walworth Mfg. Co. The last named company has a large floor space, exhibiting their various steam specialties, as has also the Lunkenheimer Co. There is also an attractive exhibit of the Crosby Steam Gauge Co. of their different gauges and valves. William Sellers has an exhibit of modern machinery and tools. Shultz Belting Co. of St. Louis, American Pulley Co. of Philadelphia, Reeves Pulley Co. and the Dodge Mfg. Co. all have attractive exhibits. The latter company show their line shafting of various styles and bearings, friction clutches, pulleys, etc. Their exhibit includes a ladies' rest room having for its supports line shafting and for its floor a pulley 14 feet in diameter. They aiso exhibit one of their pulleys which has a record speed of 33,000 feet per minute. The Reeves Pulley Co. have a wood pulley on exhibition which is 18 feet in diameter, with a 5-foot rim.

Allis-Chalmers Co. have a fine exhibit, including a working 5,000 H. P. engine and Bullock generator. In another part of this building Fernand Dehaitre of Paris exhibits a calendering machine, and in the next space Grosselin Pere et Fils, Sedan, have a napping machine in operation.

In the Palace of Agriculture, which is the largest of the buildings, embracing 22 acres, we find an exhibit of interest from Texas, "King Cotton," in sitting position 25 feet high, made entirely of cotton and surrounded by figures of colored cotton pickers —a very attractive exhibit. In the Mining Building is a statue of iron, "Vulcan, God of Fire," 56 feet high, weighing 120,000 pounds and costing $20,000. This exhibit is from Birmingham, Ala., testifying to the colossal mineral wealth of that state.

All the state buildings are of a high order of architecture and are freely used as meeting places for friends and resting places. The Louisiana Purchase Exposition is the largest exhibition the world has seen thus far and a visit will compensate any one to the fullest extent.

Accordion Plaiting Machine. K. Rabofsky, Berlin, Germany, is placing on the market an improved machine for making accordion plaiting which is so popular at the present time in dress goods.

JAPAN RAW SILK AT ST. LOUIS.

The exhibit of Japanese raw silks in the Palace of Manufactures is one of the most complete that has ever been made for any exposition, and includes not only all the important brands and grades, cocoons and filatures, but also a complete collection of models of silk-reeling establishments showing every phase of raw silk production from the egg to the bundle of silk ready for shipping.

One of the most striking features of this exhibit is a series of models showing the life history of the silk-worm, very many times greater than the natural size, commencing with the egg, and passing through the several successive stages until the final cocoon is produced. Here also is to be seen enlarged models of cocoons imitating with faithful accuracy all the details of the real cocoon, even to the enclosed pupa, and the liberated moths, both male and female. Surrounding this exhibit is a series of jars containing natural specimens of eggs, worms in all stages, and moths, so that an intelligent comparative study can be made.

On adjacent tables is to be seen a miniature silk establishment complete in every detail, and which shows both old and new types of silk reeling appliances. These models, in conjunction with the rest of the exhibit, form a section that cannot fail to attract general attention, not only from the educational, but from the technical standpoint as well. While all silk men know that Japan is a large producer of silks in all stages of manufacture, there are not many who have absolute knowledge of the diversity of brands indicating differences in grade of the raw silks.

A careful study of those exhibited shows that each silk producing district in Japan yields raw silk having qualities not possessed by the others, and which are to be taken into consideration when selections are being made for any particular purpose.

Of special interest to silk judges and experts is the series of cases showing the several important grades of cocoons and the raw silk obtained from the same, the most notable being the Tsunomata, Cross-breed (Chinese and Italian); Matamukashi; Como (Italian yellow); Koishimaru, a white variety; Akajiku, white; Onichijimi, white; Seihaku, bright yellow, and a cross-breed, pure white, between Japanese and Chinese. An interesting cross-breed is between Turkish and Italian, producing variegated colored cocoons. This entire collection is from the Sericultural School of Yokohama, and has in all twenty different specimens on view.

The exhibit of the Yokohama Silk Conditioning House is excellent, and its work is illustrated by a series of photographs showing the extent of its operations and cannot fail to elicit praise from all interested in the scientific testing and examination of silk.

Of the individual exhibits, the display is so extensive that it is difficult to make a selection, as all are superb. A few might be briefly referred to.

The Sanyen Tamaito Association has various grades from the cocoon to the finished filatures, and includes the "Tamamayu," or double cocoon silk for tram, fringes, braids, etc.

The Silk Export Association of Fukui shows various fabrics that are of wide application, including many that are colored.

Various other similar associations have similar exhibits. The display of the Silk Fabrics Manufacture Association of Kiriu, Japan, is one of the best, and includes many handsome figured effects in colors. The following facts are given which might be of interest.

Production:	
Silk goods	$5,500,000
Silk mixed goods	1,950,000
Cotton goods	50,000
Total	$7,500,000
Hand looms	21,784
Power looms	224

The collection is made from the establishments of eight exhibitors, and is worthy of close investigation.

Printed silk muslins are shown in profusion, those of Mr. T. Inagaki of Kyoto being of special interest on account of the characteristic designs.

Too numerous to mention as to individuals is a very large exhibit comprising all sorts of garments from kimonos to military uniforms

and court dress, heavily embroidered, handkerchiefs, bed spreads, waists, scarfs, table covers, piece goods of all descriptions.

From the art standpoint, the products of the Japanese artists stand alone and distinct, and cannot be compared with any other existing standards.

AN UNABRIDGED DICTIONARY OF WEAVES.

Every weaver and textile designer, compelled as he is to make slowly and laboriously a record of the weaves obtained from his own experience or to rely upon the imperfect compilations that have been published, has felt the need of a comprehensive collection to which he could refer and use as a guide. This want has at last been supplied by Franz Donat, Professor of Weaving at Reichenberg, Austria, and his work has recently been published with the reading matter in English, French and German. The book contains 9,015 designs on 300 colored lithograph plates (10 in. by 15 in.), systematically arranged to illustrate the foundation and derivative weaves. It has not been the author's object to include every possible combination in this book, as that is a manifest impossibility. He has aimed rather to make the collection so complete that the designer may find in it weaves illustrating the methods by which every weave is constructed.

The author has been engaged for ten years in the preparation of this elaborate work and states its objects as follows:

1. To introduce new ideas into the designing of textile fabrics, and to render it possible that with one and the same loom mechanism a wide range of different patterns can be woven.

2. To illustrate in some measure the infinite variety of styles that exists in the designing of textile fabrics.

3. To give the systematic development of designs as wide a range as possible.

4. To supply a reference book for the designer.

Owing to the high cost of such a work the text is printed in English, French and German in order to make it suitable for the wants of practically the whole textile world. This plan makes it possible to sell the book, well bound, at the comparatively low cost of $25. For that sum our readers can get this work which gives the results of ten years of painstaking labor by one of the leading designers of Europe. Every textile designer who keeps abreast of the times will realize the value of this treatise, which can appropriately be styled An Unabridged Dictionary of Weaves. The Lord & Nagle Co. are the American agents. The book can be seen at our Boston office.

COTTON GOODS IN MANCHURIA.

Manchuria, which is now the scene of the struggle between Russia and Japan for supremacy, is a country of vast natural resources that are still undeveloped. Its rich mineral deposits are known to include coal, iron, copper, silver and gold, while future explorations will undoubtedly reveal mineral fields that are now unknown. Henry B. Miller, U. S. consul at Niuchwang, states in a report dated April 2, that these mines have up to the present time been worked only in a small way by crude native methods. He believes that when modern processes are adopted Manchuria will prove to be one of the richest sections of Asia.

The latent resources of the country consist not only of mineral deposits, but also of extensive and valuable forests, and a fertile soil. It is favored with a healthy, invigorating climate, in which crops never fail, good water ways and a topography that greatly facilitates the building of railways. The people are industrious and intelligent, and Consul Miller considers their labor to be the best in the world for its cost. They still retain the ancient methods of their ancestors, but are receptive and the introduction of improved processes will be easy. The Russian and Chinese railroads have been in operation but a short time and the native carts are still the chief means of transportation. On this point Mr. Miller writes as follows:

The time covered by the accompanying figures does not include any period of the Russian railroad or the Chinese railroad operations. All of the traffic that these commercial statistics cover was carried in and out of the country by native boats and carts, and during the past year the bulk of the

produce came by the same old methods, the carts competing with the railroads in a haul of 400 miles or more. I believe there is no place in the world where the wagon or cart traffic is equal to that of Niuchwang. During the winter months, when the roads are firmly frozen, there are not less than 2,000 carts, each carrying 2 tons, per day coming to the port, each drawn by four to seven mules or ponies; some of these carts are from thirty to forty days on the roads in order to reach the market. It is under such conditions as these that this trade has grown, and it is a mistake to attribute the growth of this trade to the building of the Russian railway. The railways are just beginning to have an influence toward improving the trade of the country, and the natives are only beginning to alter their methods to meet these new conditions. It is plain that the railways will add much to the development of the productiveness and trade of the country, but that remains for the future to show. The country has made this marvelous growth independent of the railways, and what it will do with them will depend upon the wisdom of the railway management.

Referring to the opportunities for American trade in Manchuria, he says:

As I have previously pointed out, it is erroneous to suppose that the United States has a monopoly of the Manchurian trade or that there is no successful competitor. There are four active sources of competition, each striving for a stronger hold on the trade, and the contest is so close that the variations in the value between gold and silver have a determining influence thereon.

The strongest competitor in textiles as I have previously reported, is the product of the hand looms of China, known as nankeens, made from the yarns produced in the various cotton mills of China from both native and foreign cotton. The value of this cloth brought into Manchuria in 1902 amounted to $5,300,000, an increase of $800,000 over the year 1901. This increase was due to the low value of silver, and the American trade suffered to that extent.

The growth in the trade of United States cotton goods in Manchuria represents the greatest expansion of United States trade in the Orient, and the year 1903 proves to have been the largest in its history.

There is every reason to believe that considerable more than is shown came into the country—through the ports of Dalny and Port Arthur. The schedule of imports herewith shows that the United States has almost the entire foreign trade in cotton cloth passing through this port.

IMPORTS OF FOREIGN COTTONS AT NIUCHWANG.

Class of goods.	1899.	1903.
Drills:		
American	$1,448,798	$1,637,805
All other	.....	32,955
Total	1,448,798	1,670,760
Jeans:		
American	63,652	205,400
All other	.....	53,300
Total	63,652	258,700
Sheetings:		
American	2,800,624	2,874,235
All other	5,012	214,084
Total	2,805,636	3,088,319
Cotton flannels:		
American	.....	44,330
All other	.....	5,370
Total	.....	49,700
Shirtings (plain), gray:		
American	.....	107,965
All other	.....	212,550
Total	.....	320,515
Shirtings (plain), white:		
American	.....	4,225
All other	.....	170,040
Total	.....	174,265
Grand total:		
American	4,312,984	4,873,960
All other	5,012	688,295
Total	4,317,996	5,562,255

The Chinese nankeens are the strongest competitors in this market with the United States drills. The continued depreciation of silver during 1902 decreased the market of United States drills and increased the market for nankeens produced in a country with a silver standard.

The rise in the value of silver during 1903 has produced a result exactly the reverse, and United States drills were imported to the value of $1,637,805, against $801,560 in 1902, an increase of $836,245; while Chinese nankeens were imported in 1903 only to the value of $4,235,238 against $4,762,634 in 1902, a decrease of $527,096.

The next largest competitor with United States cotton goods is in the form of Indian yarns, which are woven on the hand looms of Manchuria into cloth and dyed—as are all imported cloth—by natives with a native product.

Indian yarn to the value of $2,148,436 was imported in 1902, which was a decrease from the previous year of $136,165.

Another growing competitor in the same form is Japanese yarn, imported to the value of $474,276 in 1902, an increase of $121,184 over 1901. This seems to offset the decrease in Indian yarns imported.

There is also a significant increase in imports of Japanese drills and sheetings, which indicates a growing trade for the products of the Japanese mills.

The fourth competitor—and the unknown quantity—is the competition of Russian cotton goods. In prints I have reason to think it is considerable, and in northern Manchuria, with Harbin as a center, I am told by the manager of the Russo-Chinese bank that Russian drills and sheetings are driving out the United States goods. These Russian goods come into the country via Dalny, Port Arthur, and Vladivostok without duty, and we have no means of ascertaining their value.

The Russo-Chinese Bank is financing a great many Chinese merchants who are sent every year to Moscow and other cities in Russia, and they report their business returns successful in all lines but sugar, and that in cotton goods their trade is growing very fast.

The cotton-goods manufacturers in the United States should study the Manchurian trade in connection with the banking business. If United States trade in Manchuria in cotton goods, kerosene, and other lines assumes the extent to which the economic opportunities entitle it, there must be developed some banking association that will assist and support it, and branches must be established in the principal trade centers of the country.

The Russo-Chinese Bank and the Yokohama Specie Bank are much more liberal in their treatment of customers when purchasing goods from their countries. This is most natural, but as there are no United States banking interests in the country this policy is seriously detrimental to United States trade that comes into competition with these banks. The fact that United States banking extension into China is now absolutely essential to the further development of our trade is apparent to all students of the commercial situation.

The opportunity for excellent returns to banking capital in Manchuria is certainly most inviting. Reliable foreign banks are paying 7 per cent. on fixed deposits and good Chinese banks will pay 10 per cent. and make a splendid profit above that.

The substantial productiveness of the country and the sure and constant markets for all the products make this a splendid field for banking capital and if utilized in connection with the extension of United States trade will be of great value to our country. In this line the country is taking on new forms and methods of business, and the political settlement that should follow the present war ought to make this country a most inviting field for United States capital and commerce.

The largest item in the value of the exports reported at Dalny is wild silk, from which pongees are made.

The year 1903 was the best that Manchuria has ever known, as to its production. Crops were unusually good and prices were also good. Both Manchuria and Mongolia are marvelously rich, and, under a good government, with transportation provided and its timber and mineral wealth developed and added to its agricultural resources, Manchuria will prove one of the greatest markets for United States goods, as well as a splendid field for the investment of United States capital. In 1894 and 1895 it was the field of war between China and Japan; in 1900 it was the district of the Boxer movements that were so destructive; and now again, in 1904, it is the theater of war between Russia and Japan.

Notwithstanding all these wars the country continues to grow in productiveness and commerce. Its people are largely industrious, frugal, and capable, and need only an enterprising, substantial, and honest government to insure them great prosperity.

Asbestos, sometimes known as mountain wool, is found in large quantities in Europe, and with less frequency in America.

Artificial Silk, Alcohol and Red Tape.

It is doubtful if in the administration of tariff laws a parallel can be found to a case that recently occurred in France.

A merchant at Rouen received from Saxony a free sample of guipure lace. Several days later he was favored by a visit from a custom house employee and presented with four sheets of paper bearing the mysterious and illegible formulas of the custom house. Their purport was a demand on the merchant for the sum of three centimes (1/2 cent), the duty on a certain quantity of alcohol which he had recently received from abroad. The merchant protested mildly that no one had sent him any alcohol and the custom house official departed.

A month later he returned still bearing the four sheets of paper and with this note on the back of one of them: Duty and manufacturing tax on alcohol in artificial silk received from abroad. The mystery was solved. The charge was for the tax on the alcohol in the finish of the silk lace. The custom officer at the frontier having overlooked this tax, had referred the matter to Rouen, hence the demand and the documents. The merchant paid the three centimes, he even paid five, and in return the four precious sheets of paper were left with him.

Hygiene of the French Textile Industry.

The Journal of the American Medical Association states that Vermersch, a French physician, has recently investigated the hygienic conditions in French textile mills and found them extremely bad. In many of the mills of Lille he found the minimum temperature to be 75 deg. F.; generally the temperature was 100 deg. F. and above. He called attention to the high degree of humidity and almost total lack of ventilation. In some of the workrooms he found 9.3 parts of carbonic acid gas per 10,000 and 1,600,000 germs per cubic inch. Of 519 sufferers from tuberculosis who applied for treatment at the Lille dispensary 109, or 20 per cent., were employed in the textile industry.

WHY TEXTILE GOODS SHOULD BE ADVERTISED.

V.

This is the fifth of a series of papers upon textile advertising by Thomas Balmer, advertising manager of the Butterick Trio—The Delineator, The Designer and the New Idea—the three publications of The Butterick Publishing Company.

1. Necessity and possibilities of textile advertising.
2. Naming and trade-marking textile goods.
3. Planning the advertising campaign.
4. General publicity and work upon dealers.
5. Actual experience of manufacturers whose advertising has been successful.
6. Brief comment upon six different lines which will then be discussed one at a time in the six following papers based upon actual statistics collected at an expense of thousands of dollars and an equal value for the time demanded for their collection.

Textiles can be advertised successfully because they have been so advertised.

It would be tremendously impressive if I could get together all the evidence of all those who have tried it and succeeded, and put it before the readers of the Textile World Record. Still one actual instance is proof that trade-marking a textile and advertising it in women's papers in the right way, with proper follow-up matter, will increase the output of any mill—will establish any fabric at a cost which makes it profitable to do so.

The evidence I am going to give is the story of Mr. H. S. Heitcamp of the Gilbert Manufacturing Company, the company which makes and advertises Pres de Soie. The evidence is the story which Mr. Heitcamp himself told at a dinner of textile manufacturers in Boston. I shall give his story in his own words with my comments.

First, Mr. Heitcamp told in an interesting way how he was inspired by an article in the New York Sun to make a cotton goods which would have the cry of silk and how he succeeded.

Then he says:

"I knew it was the best piece of goods made for the purpose intended. How was I to let the trade know what I knew, and in a way that would cause them to buy the goods? Why, when this article was first made, I had the hardest work in the world to get my salesmen to sell it. I was obliged time and time again to speak to a customer after he had bought his bill of goods and induce him to buy even a sample piece. I tell you all this detail so you may appreciate the change that has been brought about by advertising. I was a believer in advertising our goods from the start. Other members of the company did not think the way I did; I knew that this article was the best of its kind made, and that it had qualities which, up to the time of its manufacture, were the natural peculiar qualities of silk. We talked over the best ways and means of letting the greatest number of buyers know about the goods and at the least possible cost, that is, the great buying public, those who would be interested in our goods."

The Gilbert Manufacturing Company called their fabric "Pres de Soie." This is a French term which means "almost silk." This was to be the name and trade mark of the goods. Having a name and trade mark, the next step was to select an advertising medium. Mr. Heitcamp tells how he did it.

"Just at that particular time, the last week of December, 1903, I received by mail from a magazine, a large postal card which attracted my attention. It read: 'You cannot kill elephants with a pop-gun; neither can you get a page effect from an inch advertisement.'"

That magazine was The Delineator.

"I called up the New York office of this magazine and asked to have their representative call and see me. I arranged with this representative to see the advertising manager. I saw this gentleman, showed him my goods, told him my story, and ended up by saying: 'Here is a piece of goods that I know possesses qualities not found in any other goods not silk or part silk, and I believe will sell. What do you think?' I also said: 'If you do not believe in this piece of goods and do not believe it will meet with success, say so, for I do not want you to take my money and I not get any returns.' I submitted my samples to the expert fashion authorities of his magazine, and the gentleman reported: 'I think your goods can be successfully advertised.'

"We talked over various ways of advertising, and he convinced me that a two-hundred-line ad in the March and April numbers would produce the results we were after. Now, my reason for taking a large space in one paper may seem to some to have been a mistake.

The results obtained proved the contrary. My reason for taking so large a space for my goods was that I wished the readers of that particular paper to know that I had faith in my goods and was willing to spend a large amount of money to prove my convictions. That we were right has been proven. In order that the merchant might know that we were placing this ad in this magazine we placed a half-page ad in The Dry Goods Economist, Dry Goods Reporter, Dry Goodsman, and Pacific Coast Merchant."

You will notice that after advertising to reach the public through the pages of the woman's magazines, they started in to tell the dealer about the goods, because they felt sure that through advertising a demand on the dealer for Pres de Soie had been or would be created. Thus they selected among other methods trade papers reaching the dry goods trade.

"In this ad we told the merchants of the country that the March number of the Delineator, sold over the counters of the dry goods stores on February 10th, carried a three-quarter-page ad of our article, and that this article would be read by four to five million women. We expected very few direct returns from this trade ad. It was simply an announcement. We simply wanted the merchant to know where the particular article we were advertising could be had. The results from the first advertisement in The Delineator were so satisfactory and surprising that, one month later, we added the Ladies' Home Journal, American Ladies' Tailor, Le Costume Royal, Toilettes and Pictorial Review—all for the peculiar reasons or advantages each magazine possesses. There are a great many other good magazines or periodicals that we could have used, but we were soon oversold and did not think it wise to go into them. In addition to this advertising in these magazines or periodicals mentioned, we have notified thousands and thousands of dressmakers direct by small folders and have printed thousands of envelopes which have been used in the notion department of the dry goods stores, whereas before we placed it we were not able to market all our output."

You will notice also that the Gilbert Manufacturing Company had the proper help in the way of follow-up matter and special printed matter. Without such help they might have succeeded, but it would have been doubtful, uncertain and unsatisfactory. Certainly they would not have succeeded to the extent they did. No one should enter into an advertising campaign to reach the consumer without a thorough and effective system and matter for reaching the dealer, good follow-up matter for handling inquiries and a definite plan for bringing the two together. The advertising to the dealer should precede the magazine advertising a short space.

"As the result of this advertising we now have been obliged to increase the manufacture sevenfold. Two of the largest finishing works in the country are running all night in the particular department where our goods are finished and on our goods. The first of May we were over two thousand pieces behind on our orders. We have been obliged to stop selling the goods so as to catch up with our orders, and these facts are all the more wonderful when I tell you that the condition of business in our particular line has been very, very bad. We have opened accounts which have not bought from us in years. We have sold merchants who were small accounts until they have now become large accounts. One of our salesmen who travels in the Middle West visited ninety-six accounts and sold ninety-five of the ninety-six this particular grade of goods."

Last, but not least, an accurate system was established in the office of the advertiser to make every dollar's worth of advertising in the magazines pay. Here is the way, according to Mr. Heitcamp, that this worked out for his company:

"One of the features, however, that I consider contributed most to the success—if I may so term it—of the advertising of this article was due to the establishment of what is known as an office follow-up system. We have in every instance advertised so that the local merchant will get the benefit of the advertising. We have worked on the principle that every woman is entitled to the best. We have worked with the merchant on the principle that our goods were selling because they were wanted; that he wanted to sell what his customers wanted to buy, and that his cus-

tomers wanted to buy our goods. We have in every instance—when we have had a reply from any of our ads—forwarded the sample as we said we would, at once, not keeping the woman waiting for any length of time, and referred her to the local merchant. We have notified the local merchant that we have so referred her to him. We have, in this way, built up a large business on this article, and a business which pays.

"The following, cut from the New York Sun, of this month's issue, seems to fit our case exactly:

" 'No greater compliment can come to a manufacturer, nor can a more absolute proof of the excellence of his product be offered, than that the public shall demand his goods. The impelling demand for a product used by the people must come from the people if that product is to lead in its line, and any scheme of advertising that merely contemplates the middleman, and ignores the consumer, must fall short of appreciable results. When the desire for a certain article is felt by the public as the result of advertising, the middleman, jobber and retailer will hasten to supply the demand. Of what avail, on the other hand, is it to the advertiser, if the middleman's shelves are loaded with the advertiser's product and the public does not come to buy!'

"I stand here and testify to the truth, that adequate advertising and methods pay."

This is an actual, living recent instance which has happened this spring.

Here is a fabric named and trade marked, advertised adequately (220 lines) in a publication reaching women (The Delineator), supplemented by advertising in the best trade papers reaching the dry goods and department stores, together with special advertising reaching dressmakers all over the United States, further supplemented by a prompt and effective follow-up system which turns every inquiry into an order, and uses every inquiry as a club upon the dealer, behind which there is a good, broad policy which doesn't allow any one dealer in any one town to monopolize the trade in this article, and which believes that the wider the market, the less the manufacturer is at the mercy of hard times or falling off of trade in any one locality.

All of this happened exactly as it has been prophesied by me over and over again in what I have said to textile manufacturers. It is no more true of the textile manufacturers than it is of others who have tried it, or than it will be of others who are going to try it. There is nothing phenomenal in this story. Even the fact that the Gilbert Manufacturing Company is oversold is simply proof that it did not have enough experience in advertising and enough confidence in it to believe that the demand would be so great. Otherwise it might be manufacturing a larger output and advertising to sell that output.

The real result was that the advertising worked so quickly and so effectively that it soon out-distanced the manufacturing plant, and it had to be called off until everything could catch up.

The principal value of this story lies in the fact that this success which demonstrates the value of the newer methods of advertising was inaugurated by The Buttrick Publishing Company. There are other methods by which a success in advertising for this line of goods could have been secured. In fact, this same advertiser might have used a smaller space, in more numerous magazines, and maintained what would have been called a successful, profitable advertising campaign. That has been the old method; but the new method, for which this story stands sponsor, evidences the rapidity, certainty and profitableness of the large space, supplemented by persistent, intelligent office work, so that today the question of advertising, which is no longer in dispute as to whether it pays or not, is modified to the question, What method will be the most profitable for me to pursue?

The question of the profitableness of advertising is not the issue, so much as the question of what method is the most profitable, quickest and most successful.

THOMAS BALMER.

In 1786 two brothers named Barr came from Scotland to build carding, spinning and roping machines at Bridgewater, and the legislature of the State, to encourage them, gave them a bounty of $1,000 for their ingenuity and six tickets in the state land lottery in which there were no blanks.

TEXTILE PROCESSES.

EDITED BY E. A. POSSELT.

OUR TEXTILE DESIGN SCHOOL.

LESSON 6. ENTWINING TWILLS.

This system of weaves is at present coming extensively in use in connection with worsted and woolen dress goods, for which reason a description of the construction of this class of weaves will prove of the greatest of interest to the reader, since, besides the fabrics previously referred to, these weaves are also extensively used in connection with fancy cotton dress goods as well as worsted suitings, although in the latter instance only small effects, weaves repeating on few warp threads and picks, will be used; for which reason we have given a greater variety of small effects, in connection of weaves Fig. 1 to 7, although not neglecting to quote a few larger ones, the latter more particularly designed for dress goods.

Entwining twills are obtained from our regular twills by running one, two, three or more pieces of such twills, parallel to each other, at a 45° grading, and running toward these twill lines, at right angles, a second system of one, two, three or more pieces of twill lines, the size of these two sets of twill lines being equal (balanced) to each other in order to be able to produce the characteristic entwining effect from which this subdivision of twills receives its name.

These twills may be designed for any number of harnesses beginning with 8, an even number being the one to be used most satisfactorily and for which they will be found suitable for 8, 10, 12, 14, 16, 18, 22 and 24 harnesses repeat in connection with our regular fancy loom. After this they refer to Jacquard work, with the exception of fine textured cotton or silk fabrics and where they might be carried on up to 36 harnesses, according to the capacity of the dobby.

The rule for designing these weaves is:—take the number of twill lines used and multiply them with the repeat of the foundation twill, the result being the lowest number of harnesses possible to be used for a certain effect. Provided we use less than the number of twill lines possible to be used for a certain repeat of a weave, we in turn will get two open spaces in one repeat of the new weave, and which spaces (to excession a floating of warp and filling) in turn has to be properly filled up with risers and sinkers in order to obtain the final entwining twill for practical use in the loom.

By this we mean that, for example, if using the $^{2}/_{2}$ 4 harness regular twill for foundation in connection with 2 pieces of twill lines we find that $4 \times 2 = 8 = 8$ harnesses and 8 picks for the repeat of the new entwining twill is the lowest number of harnesses and picks we can use in connection with a $^{2}/_{2}$ 4 harness twill, using 2 pieces of twills to run in each direction.

Now from this follows, that, provided we would use only one twill line of this $^{2}/_{2}$ 4 harness twill, in connection with a 8×8 entwining twill, that we get two open spaces in one repeat of the weave, and which, as mentioned before, we then have to fill up in order to get a practical weave.

Again it will follow that we can increase this double twill line effect in connection with a $^{2}/_{2}$ 4 harness twill for a foundation to more than 8 harnesses and 8 picks, repeat, say for example, 10, 12, 16, etc., harnesses and picks, and in which instance we naturally will also get two open spaces in the repeat of the weave, and which in turn have to be filled up in order to get a practical final weave. This affair thus explained in connection with a $^{2}/_{2}$ 4 harness twill in turn refers also to any other weave; and, as we will go along with our lesson, we will in turn refer to that affair more in particular, in order that the student will get a thorough understanding of the construction of this subdivision of our twills.

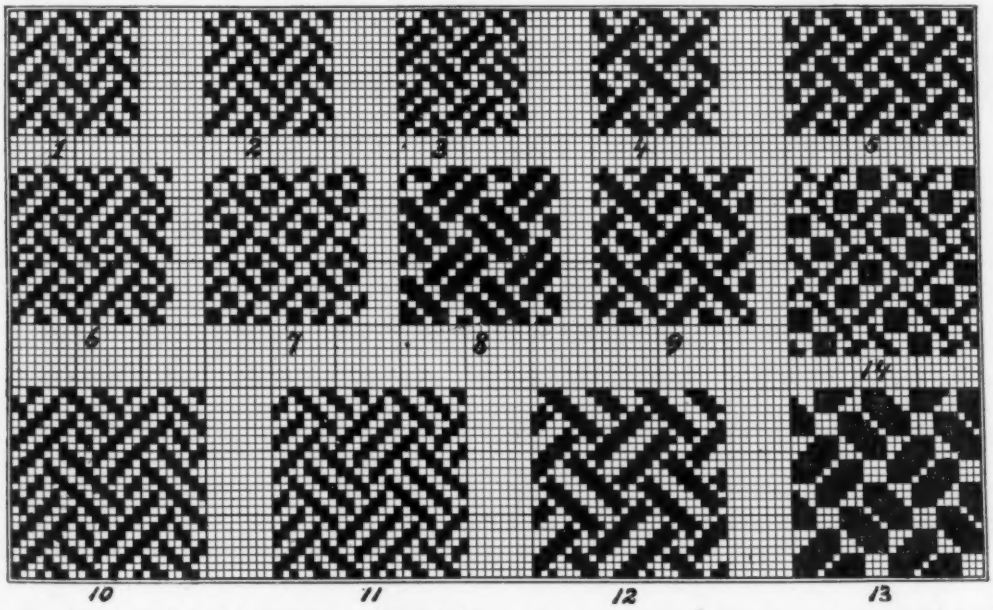
Weave Fig. 1, repeat 8×8, foundation weave the $\frac{2}{2}$ 4 harness twill, one single piece of twill entwining against another piece of a corresponding twill, this combination in turn producing two empty spaces in one repeat of the weave on account of 4×1 not equalling the repeat as laid out for the new weave, and which two empty spaces in turn had been filled up by means of 2 small pieces of broken twill lines (2 for threads each), consequently the repeat of the new weave is proven by: 4 (repeat of foundation weave) $\times$ with 1 (twill lines used) $+ 2 \times 2$ (2 small pieces of 2 threads each as required to fill up the 2 open spaces) $= 8 = 8$ warp threads and 8 picks repeat of the entwining twill.

Weave Fig. 2, repeat 8×8, has for its foundation weave again the $\frac{2}{2}$ 4 harness twill, using in this instance 2 pieces of twill lines to run against each other, and which construction, according to rules previously given, 4 (repeat of foundation weave) $\times$ 2 (pieces of twills used) $= 8 =$ repeat of this entwining twill 8 warp threads and 8 picks.

These two weaves, Figs. 1 and 2, represent two of the most frequently used affairs on account of their plain, simple, and at the same time well broken up arrangement, being weaves used every season in any fancy cotton, woolen or worsted mill, both for men's as well as women's wear.

Weave Fig. 3 shows what we might term a little fancy combination of an entwining twill, repeating on 8 warp threads and 8 picks, the new weave having for its foundation $\frac{2}{1}\frac{2}{}$, as taken from a 6, 7 or 8 harness twill, running one piece of this twill effect against another similar piece; this combination in itself resulting in a perfect entwining twill for the loom.

Weave Fig. 4 shows another entwining twill repeating on 8 warp threads and 8 picks, running one piece of $\frac{2}{2}$ 5 harness twill against another piece of the same weave. The combination of these two pieces of twill, resulting in filling up the complete entwining twill by means of a final spot, as taken from either twill line effect, in order to stop an excessive float of 5 threads each way of the weave, as otherwise would occur.



Weave Fig. 5 shows another 8 harness entwining twill, having for its foundation again the $\frac{3}{2}$ 5 harness twill, one piece of twill line in one direction running against one piece of twill line in the other direction; the open spaces caused by these weaves being filled, by means of a basket spot (2 warp threads working alike for 2 picks in a shed), set on the plain weave motive.

Weave Fig. 6, repeat 10 × 10, has for its foundation 2 pieces of twill lines of the $^{2}_{2}$ 4 harness twill run against each other, and which combination consequently, from explanation given in connection with Weave Fig. 2, will result in two open spaces left in the repeat of the weave, and which have been properly filled up by means of two risers placed side by side after the plain weave motive, in order to produce a practical entwining twill weave.

Weave Fig. 7 shows 2 pieces of fancy twill (twill and basket combination) run against each other, producing in turn a very neat little entwining twill repeating on 10 × 10.

Weave Fig. 8 shows two pieces of the $^{3}_{1}$ 4 harness regular twill run against two pieces of the same twill running in the opposite direction, the combination repeating on 10 × 10.

Weave Fig. 9 shows one piece of 3 up twill run against a piece of the small twill running in the opposite direction, the new weave repeating on 10 × 10, the two open spaces caused by the two pieces of twill lines running against each other being properly filled up with a neat little granite effect.

Weave Fig. 10 has for its foundation 2 pieces of $^{2}_{2}$ 4 harness twill run against each other. Since 4 × 2 = (only) 8 and the new weave designed to repeat on 12 × 12, we thus produce two open spaces in one repeat of the entwining twill, and which in turn we filled up by means of 2 threads of broken twill for each of the two open spaces, running said broken twill in one space in one direction and in the other space in the other direction in order to produce a well-balanced effect.

Weave Fig. 11 having for its foundation the $^{2}_{2}$ 4 harness twill, and using 3 pieces of twill lines to run in each direction, will consequently repeat on 4 (repeat of foundation twill) × 3 (number of pieces of twill lines used) = 12 = 12 warp threads and 12 picks, repeat of the entwining twill as given in Fig. 11.

Weave Fig. 12 has for its foundation 2 pieces of the $^{3}_{3}$ 6 harness twill run against each other, this combination resulting again in a complete entwining twill for the fact that 6 (repeat of foundation weave) × with 2 (pieces of twill used) = 12 = the repeat of the entwining twill = 12 warp threads and 12 picks.

Weave Fig. 13 shows a fancy arrangement of an entwining twill,—a rather open work effect, however, well balanced and suitable for ladies' wear in a high texture fabric. Repeat of weave 12 × 12. Foundation weave $^{5}_{1}$ 6 harness twill, two pieces of twills / and two pieces \ and 6 (repeat of foundation twill) × 2 (pieces of twill used) = 12 = repeat of entwining twill.

In the same manner Weave Fig. 14 shows a fancy combination of an entwining twill repeating on 12 warp threads and 12 picks, having for its foundation 2 pieces of fancy twill (twill and basket effect) running against each other. In this instance we will see that besides the entwining twill effect we produce a basket effect spotting after the 4 harness broken twill motive in the weave, a very neat effect in this instance.

Weave Fig. 15, repeat of weave 12 × 12, has for its foundation one piece of $^{3}_{1}{}^{1}$ twill line intertwining with a similar piece of twill line running in the opposite direction; this combination resulting in two open spaces filled up in turn by means of a fancy effect inverted for each space respectively.

Weave Fig. 16 has for its foundation 2 pieces of the $^{3}_{3}$ 6 harness twill run against each other, repeating on (6 × 2 =) 12 × 12. Two additional spots (risers) have been placed in each twill effect in order to stop an excessive float of four threads each way, a feature which now and then always has to be done when dealing with fancy affairs and adopting them for practical work.

Weave Fig. 17 has for its foundation two pieces of $^{3}_{1}$ 4 harness twill entwining against two similar pieces of twill running in the opposite direction, the two open spaces caused (on a count of 4 × 2 = 8 against 12 the repeat of the weave) being filled up by means of a basket effect (2 warp threads working alike with 2 picks in a shed); repeat of weave 12 × 12.

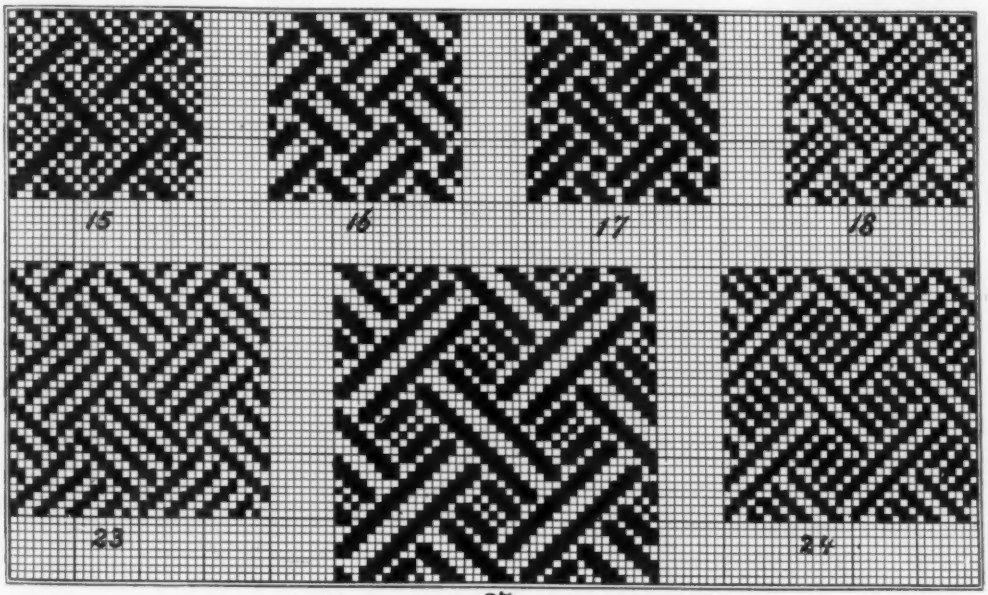
Weave Fig. 18, repeating on 12 × 12, has for its foundation one piece of $^{2}_{1}{}^{1}_{1}{}^{2}$ intertwining with a similar piece of fancy twill line running in the opposite direction. Two additional

spots have been added to the weave in order to stop excessive floating caused by size of twill line used, 7 against 12, in the repeat of the weave.

Weave Fig. 19 has for its foundation one piece of $^{2}_{1}{}^{3}_{1}{}^{2}$ intertwining with another piece of a similar twill line running in the opposite direction. On account of the size of these twill pieces used, they nearly equaling the repeat of the weave (9 to 12), and besides their shape of connecting, no additional spots are required in this instance. Repeat of this entwining twill 12×12.

Weave Fig. 22 has for its foundation two pieces of 4 up twill run against each other, the open spaces being filled up by means of two smaller pieces of the same twill. Repeat of weave 12×12.

Weave Fig. 23, repeating on 16×16, has for its foundation the $^{2}_{2}$ 4 harness twill running 4 pieces of twill lines in one direction to entwine with four pieces of twill lines, of the same foundation weave, running in the opposite direction. The combination of the twill lines quoted will require no additional filling up, *i.e.*, the twill lines intertwine perfectly with each other, without requiring additional raisers or sinkers, for the fact that 4 (repeat of the foundation weave) $\times$ 4 (number of twill lines used to run in each direction) $= 16 =$ the repeat of the entwining twill.



Weave Fig. 20 has for its foundation one piece of $^{3}_{1}{}^{1}_{1}{}^{3}$ twill entwining with a similar piece of twill running in the opposite direction. Repeat of entwining twill is 12×12, no additional spots being required since size of foundation twill piece $= 9 =$ the size of the one used in previously given example.

Weave Fig. 21 is closely related, with reference to its construction, to Weave Fig. 16, as previously explained, the only difference being the beginning and ending of the fonndation twill, which however, in the present instance, is of such a nature that no additional spotting, as was necessary in connection with weave 16, had to be used. Repeat of weave 12×12.

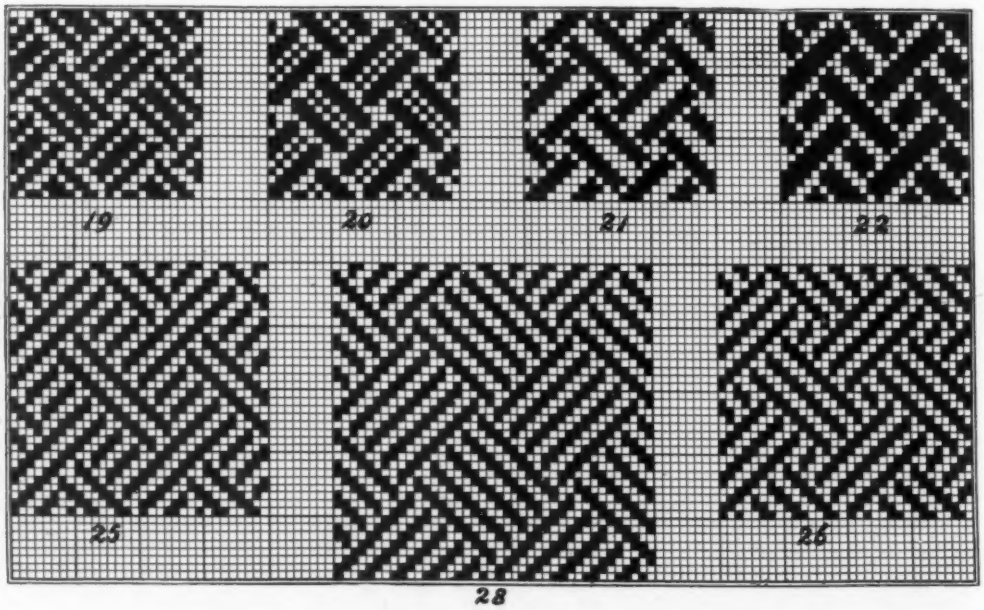
Weave Fig. 24 is another entwining twill repeating on 16×16. This weave has for its foundation two pieces of the $^{2}_{2}$ 4 harness twill to entwine with two pieces of the same foundation twill running in the opposite direction. In this instance two open spaces are left, for the fact that 4×2 does not equal 16, said two open spaces left having in turn been filled up with three pieces $^{2}_{1}$ 3 harness twill, the direction of the twill in either spot being reversed in

order to produce a good cutting off, as well as effect, in general.

Weave Fig. 25 corresponds with reference to its foundation entirely with the previously explained weave, however in this instance we used two pieces of the $^{2}_{2}$ 4 harness twill for filling up the two open spaces caused by the foundation twills intertwining, and as done in the preceding example by means of three pieces of the $^{2}_{1}$ 3 harness twill. In this instance, however, we have not reversed the direction of the twill pieces as used for filling up the two open spaces in the weave, a feature which in turn certainly cannot help but produce a new novel effect to the entwining twill, the repeat of which is 16 × 16.

Weave Fig. 26 shows another entwining twill for 16 harnesses and 16 picks repeat. In this instance we used three piece of the $^{2}_{2}$ 4 harness twill to entwine with three pieces of the same twill as running in the opposite direction, in turn leaving again two open spaces, each one of which we filled with two warp threads of $^{2}_{2}$ 4 harness twill, for the fact that 4 (foundation twill) × 3 (pieces of twill used) + 2 × 2 (two additional threads for each of the two spots) = 16 = the repeat of the entwining twill warp and filling ways.

Weave 27 has for its foundation two pieces of the $^{3}_{3}$ 6 harness twill, entwining with two similar pieces of twill running in the opposite direction, the two open spaces caused in the repeat of the entwining twill, being filled up each one by means of a piece of $^{3}_{1}{}^{1}_{1}{}^{3}$ twill, the direction of said two twill pieces being arranged to run the reverse, similar to the main entwining twills, in order to produce perfect cut-off as well as balanced effect to the new entwining twill.



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Weave 28 shows the proper entwining twill as produced by means of five pieces of the $^{2}_{2}$ 4 harness twill, for 20 warp threads and 20 picks repeat, no open spaces resulting since 4 × 5 = 20.

Weaves Figs. 29, 30, 31, 32 show four large effects in entwining twills, repeating on 24 warp threads and 24 picks.

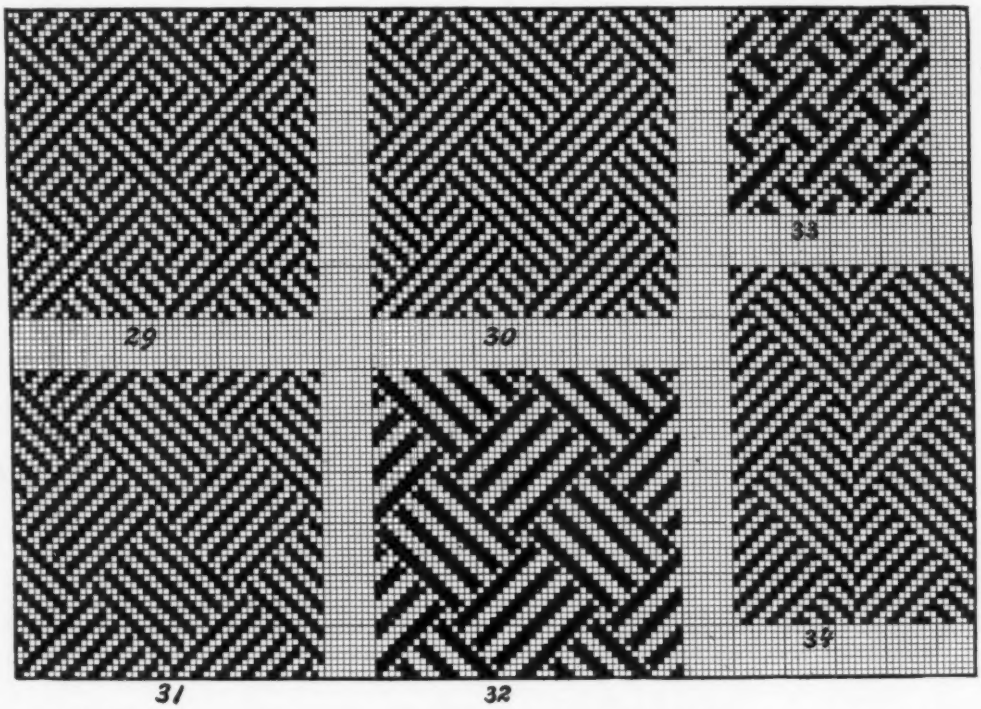
In connection with Weave Fig. 29 we use the $^{2}_{2}$ 4 harness twill for the foundation, entwining two pieces of these twill lines against each other, leaving in turn two large open spaces since 4 × 2 = only 8 and not 24. This

permitted us to introduce an additional entwining twill effect for each open space in the entwining twill, resulting in turn in a very neat and novel effect, used very extensively both for men's and women's wear in woolen, worsted and cotton. Repeat of weave 24 × 24.

Weave Fig. 30 has the same $^{2}/_{2}$ 4 harness twill for its foundation, calling in this instance for four twill lines running in one direction to entwine with four twill lines of this weave running in the opposite direction. Since again 4 × 4 does not equal 24 — the repeat of the new entwining twill — consequently two open spaces are produced (although not as large as in the preceding example) and which open spaces we in turn filled up with two 4 harness twill pieces, in each spot reversing the direction of the twill. Repeat of weave 24 × 24.

Weave Fig. 31 shows the completely filled up entwining twill produced by means of six pieces of $^{2}/_{2}$ 4 harness twill, entwining against six pieces of the same twill running in the opposite direction, for 24 harness × 24 picks repeat. Proof 6 × 4 = 24 = repeat of weave = no open spots possible.

Weave Fig. 32 shows the completely connecting entwining twill produced with four pieces of $^{3}/_{3}$ 6 harness twill, running from left to right and entwining against four corresponding pieces of 6 harness twill, but running in the reverse direction. For the fact that 6 (repeat of foundation weave) × 4 (pieces of twill used) = 24 = the repeat of the entwining twill both warp and filling ways, no open spaces are possible, *i.e.*, the eight pieces of twill lines as entwining in series of fours against each other form the complete weave.



Weave Fig. 33 shows what we might call "an entwining twill spotting," a very ingenious way of constructing such novelty weaves, however, requiring a great number of harnesses for their execution in practical work. The spotting in this instance has been done after the 8 harness satin motive, the complete weave calling for its repeat 32 × 32. In the same manner, as in this instance, we have used 3 up for the size of twill, we can use 4 up or 2 up only again in the same manner as we used 8 threads for each spotting of twill line, we might use more or less threads; again in the same manner as we used

the 8 leaf satin for the motive of spotting, we can use the 5 leaf satin for this purpose, in turn either increasing or decreasing, as the case may be, the repeat of the new weave thus obtained.

Weave Fig. 34, repeating on 19 × 28, shows a very unique way of combining entwining twills in order to produce a novel effect, the present weave being a specimen of an entwining twill this season in use in connection with fancy worsted suitings.

Having thus given a very extensive line of entwining twills, and at the same time thoroughly explained their construction, it will be easy for the student to construct any number of these weaves, to suit any number harness required, as fashion may dictate.

POINTS ON TEXTILE CALCULATIONS.

III

To ascertain weight in ounces for a given number of yards of yarn.

Rule a:—Multiply given yards by 16 (ounces per one lb.) and divide the result by the number of yards of the known count required to balance 1 lb., or

Rule b:—Divide the given yards by the number of yards of the known count required to balance one oz.

QUESTION:—Find weight in ounces for

(1) 16800 yards of single 40's cotton yarn.
(2) 18900 " " 2/60's cotton yarn.
(3) 15750 " " 3/90's cotton yarn.
(4) 3375 " " 18 cut woolen yarn.
(5) 3300 " " 2 ply 32 cut woolen yarn.
(6) 11760 " " single 48's worsted yarn.
(7) 5460 " " 2/52's worsted yarn.
(8) 8925 " " 3/90's worsted yarn.

Examples thus quoted are solved by rule a, thus:

(1) 16800 × 16 = 268800 ÷ 33600 = 8 oz.
(2) 18900 × 16 = 302400 ÷ 25200 = 12 oz.
(3) 15750 × 16 = 252000 ÷ 25200 = 10 oz.
(4) 3375 × 16 = 54000 ÷ 5400 = 10 oz.
(5) 3300 × 16 = 52800 ÷ 4800 = 11 oz.
(6) 11760 × 16 = 188160 ÷ 26880 = 7 oz.
(7) 5460 × 16 = 87360 ÷ 14560 = 6 oz.
(8) 8925 × 16 = 142800 ÷ 16800 = 8½ oz.

Next let us prove correctness of answers by rule b.

(1) 33600 ÷ 16 = 2100 and 16800 ÷ 2100 = 8 oz.
(2) 25200 ÷ 16 = 1575 and 18900 ÷ 1575 = 12 oz.
(3) 25200 ÷ 16 = 1575 and 15750 ÷ 1575 = 10 oz.
(4) 5400 ÷ 16 = 337½ and 3375 ÷ 337½ = 10 oz.
(5) 4800 ÷ 16 = 300 and 3300 ÷ 300 = 11 oz.
(6) 26880 ÷ 16 = 1680 and 11760 ÷ 1680 = 7 oz.
(7) 14560 ÷ 16 = 910 and 5460 ÷ 910 = 6 oz.
(8) 16800 ÷ 16 = 1050 and 8925 ÷ 1050 = 8½ oz.

With reference to woolen yarn graded by the run basis these calculations are somewhat easier for the fact that by this system of grading yarns the number of the run in question equals 100 times the number of ounces that one lb. contains; consequently by multiplying the size of the yarn given in run counts by 100, and dividing the result into the number of yards given (for which we have to find the weight), gives us × as the result the weight expressed in ounces.

EXAMPLE. Find weight for 4200 yards of 5¼ run woolen yarn,

$$42 \div 5\tfrac{1}{4} = 8 \text{ oz.} + \text{Ans.}$$

find weight for 2250 yards of 2 ply, 6 run twist.

2 ply 6 run = single 3 run and

$$22.50 \div 3 = 7\tfrac{1}{2} \text{ oz. Ans.}$$

LESSON:—Find weight in ounces for

1. 14175 yards of 40's cotton yarn.
2. 15750 " " 2/60's cotton yarn.
3. 12600 " " 3/90's cotton yarn.
4. 2700 " " 18 cut woolen yarn.
5. 2375 " " 2 ply 32 cut woolen yarn.
6. 10500 " " single 48's worsted yarn.
7. 8645 " " 2/52's worsted yarn.
8. 8925 " " 3/90's worsted yarn.
9. 3325 " " 3½ run woolen yarn.

Answers to lesson are:—

1 — 6¾ oz.
2 — 10 "
3 — 8 "
4 — 8 "
5 — 7¾ "
6 — 6¼ "
7 — 9½ "
8 — 8½ "
9 — 9½ "

In the thirty years from 1870 to 1900 the amount of cotton produced in the United States increased over 200 per cent.

SIZING COMPOUND FOR TEXTILE MATERIALS.

Sizing is a very necessary process in the manufacture and finishing of cloth, and the suitability of a size for certain kinds of cloth greatly aids in these processes, as well as improving the feel and appearance of the woven cloth. Sizings are used chiefly to render the fibres soft and pliable, adding body, weight and gloss to them, and giving them more durability, according to the amount of size used.

It has been found that the amids of stearic acids or similar fatty acids and their derivatives, are not soluble in cold or warm water, but can be made into an extremely fine emulsion with soap solutions, and kept in this condition for practically any length of time. The stear amids may be also made into an emulsion by working them into warm solutions made of starch, glue, or casein, which, as well as the soap solution, have the property of keeping the amid in a finely divided and insoluble state, and which can be diluted to any extent with water without separating the constituents, thus forming a sizing compound which may be used on textile material.

An important property of this sizing is that it cannot be washed out by cold water. A sizing compound made from pure stear amid, forms either a snow white light amorphus powder or a product of fine crystalline scales with a silky gloss, according to the method of manufacture, and is insoluble in cold or boiling water and only slightly soluble in cold alcohol, ether, benzol, benzine or chloroform, but is readily soluble in the latter solvents when heated. Its melting temperature is between 226 deg. F. and 228 deg. F. It resists the chemical action of weak solutions of alkalies, as well as of mineral organic acids. The soap or glue solutions in which the stear amid is suspended, are of a thin consistency when warm, but become thicker and smooth when cooled down.

The sizing compound is made by preparing an ordinary boiling soap solution, and then adding an equal quantity of the stear amid or varying the amount of the latter as the material to be sized may require. The mixture is then constantly agitated until the stear amid melts, thus forming the sizing compound. Glue and casein solutions may be similarly prepared and the stear amid added.

When sizing cotton or silk goods with the sizing compound, the fabric may be afterwards passed through an alum bath, thus forming an insoluble aluminium salt, which in combination with the amid, renders the goods waterproof.

THE CONSTRUCTION AND OPERATION OF ELECTRIC STOP MOTIONS FOR WARPERS.

The object of this motion, as its name indicates, is to stop the warper automatically by an electrical device when a thread breaks as it is being wound on the beam from a bobbin in the creel. The principle of the motion is based on the completion of an electric circuit by the dropping of a thread detector wire which is supported out of contact with the connections when the thread is running properly.

The application of the stop motion to the

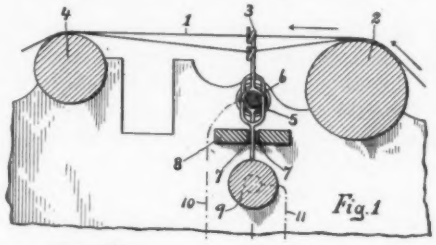


Fig. 1

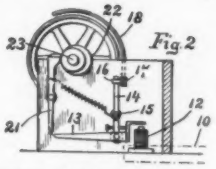


Fig. 2

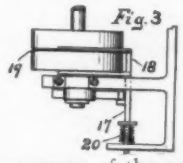


Fig. 3

warper is best shown by means of the accompanying illustrations, of which Fig. 1 is a cross section of that portion of a regular warper (between the creel situated in back of the machine and the front beaming arrangement) necessary to show the arrangement for completing the electric circuit when a thread breaks. Fig. 2 is a portion of the stop motion, showing the levers which are actuated to stop the machine when the circuit is com-

pleted. Fig. 3 is a top view of the belt shifter, showing how it is actuated to stop the machine when a thread breaks.

Referring to the illustrations, the warp threads, 1, to be wound on to the beam are drawn from the creel in the direction of the arrow, over and under the usual rollers to the measuring roll, 2, and from there they are passed separately through drop wire, 3, to guide roller, 4, and from there to the warp section beam as placed at the front of the machine. The drop wires are held suspended (circuit open) by the tension of the threads, which is sufficient when the latter are running properly, said wires being made with loops, 5, by which they are threaded on a metallic bar, 6, and thus held from dropping entirely out of the machine when a thread breaks. The lower ends of the wires are held between metallic strips, 7, in a wooden cross board, 8, to keep them vertical.

Below the board, 8, and its strips, 7, is arranged a metallic roller, 9, journaled in suitable bearings in the main frame and connected by pulleys with the main shaft of the machine, so that when the machine is in motion, the roller is rotated, the object being to have as little chance as possible of contact not being made properly. The rod, 6, is held in insulating blocks, attached to the main frame, and this rod and the strips, 7, are connected by a wire, so that they form one terminal of an electric circuit, while the roller, 9, forms the other terminal. The rod, 6, is connected with a wire, 10, and the roller, 9, is connected with the wire, 11, the latter being connected with the source of electrical energy, both wires being connected with an electromagnet, 12 (see Fig. 2), controlling the lever, 13, as hung on the lower end of a vertical lever, 14, fulcrumed at, 15, on the main frame.

The lever, 13, hangs normally above and out of engagement with the core of the electromagnet, 12, that is, as long as the latter has no electric current passing through it, but when one of the detector wires, 3, drops on the breaking of its thread, then its lower end comes in contact with the revolving roller, 9, so that the circuit is completed and the electromagnet, 12, is energized to attract the lever, 13.

The upper end of the lever, 14, carrying the lever, 13, is engaged by a projection, 16, on a shipper bar, 17, of the belt shipper, 18, to hold the latter in such position that the belt engages the fast pulley, 19. The shipper bar is spring controlled as at, 20, so that when the lever, 14, swings out of engagement with the lug, 16, then the shipper bar, 17, is moved transversely by the action of the spring, 20, to cause the shifter to move the belt from the fast to the loose pulley.

A vibrating lever, 21, fulcrumed on the main frame, receives a vibratory motion from a cam, 22, on the main shaft, 23, and the lower end of this vibrating lever vibrates normally over one end of the lever 13. Now when the latter is attracted by the electromagnet, 12, becoming energized, by the closing of the circuit due to a thread breaking, then the lever, 13, swings up and into the path of the lower end of the vibrating lever, 21, so that the latter pushes the lever, 13, to one side, and this imparts a swinging motion to the lever, 14, to move the latter out of engagement with the lug, 16, and the belt is shifted from the fast pulley to the loose pulley by means of the spring, 20.

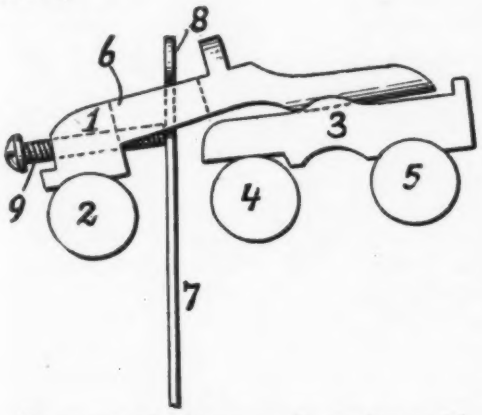
DIXON'S IMPROVED TOP ROLL SADDLE FOR SPINNING FRAMES.

The object of the improvement is to provide an adjustable weighting arrangement for the top rolls, the arrangement consisting principally of a specially made top front roll saddle and a weight strap to be hung from said saddle.

The details of the arrangement are shown in the accompanying illustration, which is a side view, showing the front and rear top roll saddles bearing on the journals of the top drawing rolls, and the front saddle provided with an adjusting screw, against which the weight strap bears. In the illustration, 1 indicates the top front roll saddle, having its front end resting on the front roll 2 and its back end on a pivot point on the rear saddle 3, the latter resting with its front end on the middle roll 4 and its back end on the back roll 5.

The front saddle 1 is provided with a vertical slot 6, in which the weight strap 7 hangs, the latter being provided at its top end with a widened part 8 which acts to hold the strap up.

Projecting into the slot 6 from the front end of the saddle 1 is a screw 9 and against the end of which the weight strap 7 always rests, owing to the slanting position of the saddle 1, which causes said weight strap 7 to slide down until it comes in contact with the end of the screw 9.

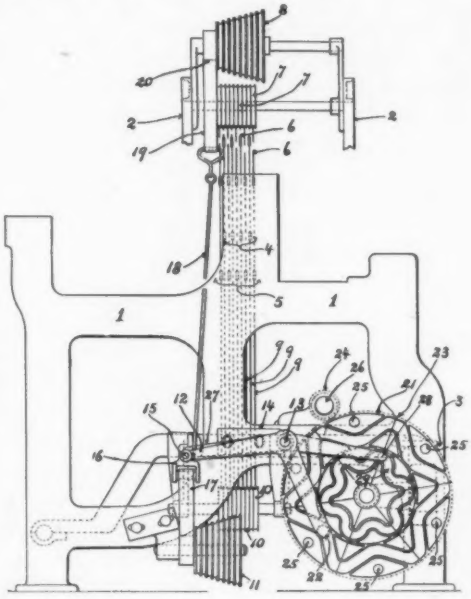


By means of this screw, the resting position of the weight strap may be changed with a screw driver, thus changing the amount of weight bearing on the front roll to suit the requirements of the yarn being spun. The change may be made while the frame is running and the results immediately seen, thus making the proper regulation easier.

A NEW SHEDDING MECHANISM FOR STAFFORD LOOMS.

This shedding mechanism is to be used in connection with fabrics requiring an extra heavy warp texture, interlaced either with the plain weave or its derivative weaves, the object being to separate the ends in the warp as much as possible and thus produce better sheds during weaving. The new shedding mechanism, besides providing the motion for the several harnesses for the two planes of the shed, also has an arrangement by which one, two, three, or more picks may be inserted in the same shed.

The details of the mechanism and its application to the loom are shown in the accompanying illustration, which is a side view of a loom, showing a sufficient portion of it to explain the device. Referring to the illustration, 1 indicates one of the side frames of a loom, the left hand side of the illustration being the front side of the loom. 2 is the arch and 3 the cross girth at the rear of the loom. The harnesses are arranged in the loom to have every alternate harness carry the warp threads for one plane of the shed while those between these carry the threads of the other plane, one series (raised) being indicated by 4 and the other (lowered) by 5. From the top sides of the harnesses 4 and 5, their respective top cords 6 pass over a series of sheaves 7 to a grooved cone 8, each succeeding cord toward the back of the loom being attached to a respective projection on said cone 8, one series of harness cords being passed to the top of the cone while the other series is passed under and around the cone, in order to have the harness in one series move up while those in the other moves down when motion is imparted to the cone. This cone 8 is carried by a shaft as placed in bearings on the arches of the loom.



The lower ends of the harnesses are connected in a similar manner by means of cords 9 passing under sheaves 10 to the grooved cone 11, and consequently the two cones mentioned must be moved in unison in order to produce a shed for the insertion of filling. For the purpose of oscillating these two cones at

the required times and in unison, an operating lever 12 is employed, said lever being pivoted at 13 upon a stand 14 which is bolted to the loom side 1. One arm of this lever 12 has pivotally connected with it at 15 a strap swivel 16, to which is connected a strap 17, said strap being wrapped under and partly around the periphery of a roll, fast with the lower cone 11, the extremity of the strap being attached to said periphery. A suitable connection 18, made of wire, has its lower end connected with the swivel 16, the upper end being connected with a strap 19, said strap having the other extremity wrapped partly around and secured to a roll 20, made fast to the upper cone 8. Two other straps are similarly attached to the rolls on the other side and connected together by means of a rod similar to 18; which is necessary to complete the movement of the first connection to the cones.

The lever 12 is actuated by a cam 21 in which a cam roll 22 on the end of said lever 12, works. This cam is fixed on a gear 23 which is driven by a small gear 24.

In some fabrics it is desired to put one pick of filling into each shed in the warps, while in other fabrics it is desired to put two picks in each shed, and so on. In order to provide readily for securing this required change in the working of the harnesses, the cam 21 is made removable and replacable, so as to enable another cam to be applied, having a path corresponding with the character of shedding which is required. The cam is made up of a number of segments which are held to the cam carrying gear 23 by means of bolts 25. This construction enables the segments which are in use at any time to be readily removed and replaced by a set of segments corresponding with the required action of the harnesses. It will be understood that the relative speed of the gear 23 must correspond with a multiple of the number of picks which is desired to introduce into each shed. Thus in the construction shown, the gears 24 and 23 are so proportioned as to cause one revolution of the cam for six revolutions of the cam shaft 26—that is to say, one revolution of the cam is produced for every twelve picks. Hence either two, three, four, or six picks may be introduced into each shed of the warps, according to the arrangement of the outline of the cam.

The selvage harnesses are operated from a lever 27, which is mounted upon the pin 13, alongside the lever 12 and is provided with a roll 28, working the cam groove 29, which latter is provided upon the cam 21. The selvage harness frames are not shown, but may be arranged in any suitable manner.

THE SHRINKAGE OF WOOLENS IN DYEING AND FINISHING.

Most all woolen goods, when submitted to finishing and dyeing, shrink, more or less, in their length and width, caused generally by the forward motion of the fabric under a certain tension when under operation in the machine, heat and moisture during the process of fulling being the chief agents producing this result. Since the finished fabric has to reach the market at a certain width and weight, the finisher consequently has to exercise the greatest of care during the various processes of finishing, especially at the fulling or felting process, to obtain the required length, width and weight for the fabric. It is sometimes difficult to determine beforehand the proportions of shrinkage for a certain kind of fabric, since often unforeseen changes in the construction of the same style of fabrics may occur, and which overthrow all previous calculations; for instance, a change of wool often requires a different treatment of the cloth in scouring, fulling and dyeing, and, in the same manner, an apparently trifling difference in the counts of the yarn used in the construction of the fabric, may produce similar results in fulling and finishing.

The behavior of the cloth in fulling may serve, to a certain extent, as a guide, since the quicker a piece fulls in its width, the more will it be inclined to shrink in the subsequent operations, and this will be the case, especially with light weight fabrics, such as cheviots, serges, meltons, etc., when the felting capacity of the wool fibre is not entirely exhausted, and when the inclination to shrink is still proportionally strong in the fabric after leaving the fulling mill. It often happens that easily fulling fabrics will shrink considerably in their width after having been

withdrawn from the fulling mill, previously to being scoured.

The weave must also be considered, since loosely woven fabrics, especially double cloth structures, are more liable to shrink in their width and draw out in length than fabrics constructed with tight interlacing single cloth weaves. The color of the fabric may also exert an influence in some cases, for example, white, light colored and indigo blue goods are always more inclined to shrink in their width and stretch in length than dark brown, dark green and black fabrics, because the shrinking capacity and elasticity of the fibres in the latter fabrics have been impaired by boiling and mordanting with chemicals during dyeing.

The endeavor to preserve the full width of the goods, even when they are light and loosely woven, must not be pushed too far, because light and loosely woven stuff does not shrink so rapidly at the beginning of the fulling process as when the felting has progressed to a certain point, after which the goods begin to shrink more rapidly. For example, let us consider a cheviot or melton, intended for piece dyed blue. In order to reduce it to 56 inches wide, we should, perhaps, be obliged to take it from the fulling mill at from 57 3/4 to 58 inches wide. Up to 58 1/2 inches, the felting progresses slowly, but, after that, it is accelerated, and after from ten to fifteen minutes, we have obtained the width of 57 3/4 inches. If we exceed this, even by one-half inch or one inch, or, in other words, continue to full to 57 or 56 1/2 inches, and since the piece will shrink very much in the subsequent scouring, the same may be found, after the latter operation, reduced to 54 1/2 inches, and, perhaps, as narrow as 54 inches wide only. The piece is then too narrow, since it will become still narrower during dyeing and subsequent operations.

Suppose we take the next piece out of the fulling mill when from 58 1/2 to 59 1/4 inches wide. In this case, while with the first piece we experience a loss of from two to three inches after scouring, we may now have a shrinkage of about 1/2 inch only, because it was removed before the period of more rapid fulling of the fabric (i. e., felting of the fibres) had arrived, we find that the present piece, which, after scouring, is still perhaps 56 3/4 to 58 1/2 inches wide, shrinks less in dyeing and rinsing, and consequently remains too wide (above 56 inches). For this reason, therefore, the fuller must be very careful to notice the time when the fulling process with a fabric under operation begins to accelerate. To stop fulling with half an inch difference, either before or after this time, frequently makes a great difference afterwards in the finished fabric with reference to its final width, fabrics of close warp and strong fulling tendency suffering less change in length and width afterwards in finishing. It may also happen that goods which were shrunk with difficulty in their width, become again wider, later on during finishing, a feature also applicable to fabrics which shrunk hard in their length.

The treatment in washing, finishing, and dyeing, finally, is another factor requiring consideration, when establishing the proper dimensions of length and width of the fabric at fulling. It is evident that a light or loose cloth, which in turn is to be submitted to a more or less severe gigging process, must be left wider at fulling than one which is not required to undergo this treatment. In the same manner, piece dye goods, treated energetically in the washing machine, for the purpose of rinsing, must be kept wider at fulling than wool dyed goods. Heavy, wool dyed cloths for nap finishing, such as satins, doeskins, kerseys, beavers, etc., and which are steam lustred afterwards, need not issue from the mill any wider than is required, so that they can be tentered well in drying, to make them smooth. The steam lustring fixes their width and length imparted by the preceding tentering and drying, and, in this manner, they receive their final width in a more natural manner. Piece dyed goods of this kind, however, must be left some wider, as the felting capacity of the fibres is then not weakened by mordanting and boiling, in consequence of which they will generally shrink some afterwards in scouring and gigging, and, owing to their natural elasticity will also stretch more or less in length, which is, in

most cases, just as disagreeable as the shrinkage in width, because the required finished weight of the fabric is thus influenced.

The operations that follow fulling produce also a change in woolen goods. Of these, washing is the chief cause. The fact that soap, an agent which promotes the felting process, is employed during this process, certainly tends to further felting; for which reason, in connection with fabrics that were not fulled to the complete exhaustion of their felting capacity, an after felting, and consequent shrinkage in washing is unavoidable. However, in this instance the shrinkage takes place only in the width of the fabric, corresponding to the mechanical treatment in washing, viz., by drawing it lengthwise and applying pressure, and whereby the cloth is stretched in length.

The temperature of the bath used for washing is also an important factor, since it is a feature which must be remembered, that some fabrics will felt during washing, provided warm water is employed, but which will not shrink in connection with cold water. Again, fabrics will have a tendency to shrink considerably more when the washing, as done in some mills, is carried on in the fulling mill, i. e., after the fulling of the cloth in question has been finished, than if said washing is done either in an open width or rope washer. Without taking account at present of other evils invited by washing the fabric in the fulling mill, and which partly consist in fixing cockles more obstinately, and an insufficient washing, both items being the consequence of the little space afforded to the goods in the channel of the fulling mill, as well as insufficient overhauling, etc., the only advantage being that the cloth is not drawn out so much in length when washed in the fulling mill. As long as the cloth runs in the soap, it will generally crimp in the channels, even though the crimping box is ungeared, and good cloth possessing a certain inclination to felt will thereby continue to shrink in length. It is a well known fact that nearly all the changes occurring in the texture of the cloth are directly due to washing it in the fulling mill, a feature which does not happen so often in the ordinary rope washing machine. Here it is only necessary to take into account the entrance of the cloth through the guide board, and, next, its stretching produced by the drawing up from the bowl—a stretching which is caused by its own weight. Nevertheless the cloth is invariably stretched to a certain extent in this machine also, and contracts in width, especially when the apertures of the guide board are only as small as are required for the proper entrance of the rope, and the prevention of cockles and creases.

It is asserted by some mills that some makes of "openwidth washers" stretch the cloth under operation more excessively than absolutely required, thus reducing it in its width. It is evident that the cloth, when running in its full width between the rollers, must be spread out to its full extent, which can only be done at corresponding tension, or else one of the principal purposes of the machine, the smoothening of the cloth, would not be attained.

Fabrics are rarely carbonized after fulling, carbonizing generally preceding the fulling, but it may be found necessary under certain circumstances to carbonize after fulling, in which instance this process also causes stretching and shrinkage of the cloth under operation, since the latter, by treatment with acid at a high temperature, becomes looser in feel, and the texture is so loosened, so that, when neutralized in the washing machine, it stretches to a considerable degree, as has been ascertained by repeated trials.

Gigging is another process which causes a change of texture to the cloth since the latter must be kept at a certain tension when passing the gig roll, however this tension can be regulated, so that, when treating light and loose cloth, an undue stretching may be more or less prevented. Stretching is particularly favored during gigging when loosening the felt, the fabric thus becoming softer and more elastic, and, consequently, more inclined to stretch, but which tendency is greatly relieved by the fact that the cloth which is from its nature inclined to stretch—for example, light, loosely constructed fabrics are only moderately gigged, and is, therefore, not so long exposed to the stretching process as cloth which, in consequence of its denser texture and more compact felt, offers much

greater resistance to the stretching. When the gigged cloth is submitted to a wet lustring (boiling) directly after having been napped, a slight stretching in length may be expected, due not so much to the rolling up of the cloth, which is generally accomplished with little tension, as to the subsequent rinsing, provided the cloth, softened by the hot water bath, has thus been entered into the washing machine, in which it is often treated for some time, in "full" water.

In connection with piece dyed goods, the dyeing often causes a change in the texture, and which increases with the degree of the felting capacity of the wool. In order to prevent this change in texture in the cloth, as well as the formation of creases and cockles, and, in napped goods, the entangling of the nap, all the goods, at least those of a better class, to be piece dyed, are first steam lustred, whereby the position of the fibres on the fabric are fixed. The nature of the fibre is killed by steam lustring—that is, it is deprived, more or less, of its shrinkage capacity, after which it appears to be less inclined to change in form and position. The difference in behavior between sharply steam lustred and non-lustred cloth is very marked, as regards its inclination to shrink during or after dyeing. Cloth will stretch in steam lustring, in consequence of its being wrapped tightly around the cylinder, which may, according to its elasticity, amount to four per cent., and this must be taken into account when deciding upon the extent to which the cloth is likely to shrink. Since the cloth is to be dried before steam lustring, the stretching in length by the latter process can be counteracted by stretching the cloth during tentering more in its width than in length. In the case of light and loose textures, when the finisher may count on a shrinkage in dyeing, in spite of the steam lustring, an incidental difference may be avoided by stretching these fabrics, during tentering, a little more in their width before the steam lustring. However, experience only will enable the finisher to determine the exact amount. The treatment of the piece dyed worsted upon the crabbing machine answers the same purpose as steam lustring before dyeing in connection with woolens.

Although incidental losses in width of a fabric may be equalized again by the tentering and drying after the teaseling, still this cannot be applied extensively. Nevertheless, small differences may always be corrected by the tentering, because, according to the larger or smaller shrinking capacity of a fabric in question, a part of the additional length or width caused by tentering will remain after making the fabric ready for the market. This takes place in a reverse ratio, that is, the less capacity the cloth has to shrink, the better it retains the stretch imparted to it. For example, let us consider a piece of wool dyed plain, or twilled cloth, strongly fulled, and well gigged, which when finished should be 56 inches wide, but which after gigging came only up to 55 inches. Provided we tenter this piece in the ordinary manner, that is, stretch it in width from one to two inches, as is generally done, in order to smooth it well, it will very likely return to its original breadth of 55 inches when making it ready for the market. However, by stretching the fabric double the amount just stated, the fabric will come out at least 56 inches wide finished.

More difficulty certainly is experienced with fabrics of light fulling quality, having their shrinking and felting capacity not yet fully exhausted, and which keep on shrinking with every operation they are subjected to, for which reason they must consequently be tentered very strongly, especially with reference to their width. Sometimes light cheviots and serges which, before drying, are of the required width, after being made ready for the market may then be found narrow and consequently will have to be stretched again in their width, sometimes up to 4 inches in order to give them the required final width.

The proportions of length and width of a face finished fabric are best regulated by tentering, before steam lustring, since the cloth retains the greater part of the length and width imparted to it by drying by the fixing process of steam lustring, and often it preserves it permanently. It is even possible to restore cloth, which has shrunk excessively in width or in length by the fulling, to the dimensions required, by strong tentering,

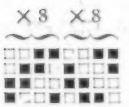
either in length or width, and then thorough steam lustring.

The effect of stretching in length and width of a fabric is not so great on dry cloth as on wet, and, therefore, the tension during the shearing operation of the cloth has little or no influence, at least upon heavily fulled goods, and alters them neither in length nor in width, a feature which, however, is not the case in connection with very light textured cloth, and which contract more or less in width, due to the tension upon the ledger blade, which shrinkage will be proportionate to the extent to which the fabric was stretched in width when tentered (stretched) for drying. This must carefully be taken into consideration in drying, and light and loose goods are to be tentered correspondingly more in their width.

The cylinder press may also cause a change in the texture of the fabric, principally due to the fact that the cloth under operation still contains a certain percentage of moisture, whereby it is softened between the hot press faces, and then carried along under tension, which, under certain conditions, causes it to stretch considerably. This feature, however, is not of great moment in the case of cloths made ready for the market after the pressing, since, by this process, the original proportions are restored, especially if the operation is performed upon a steaming table, but, it may happen that, in roller steaming, the proper shrinkage will not occur, especially if the cloth after being wound is kept rather tight.

NOVELTIES FROM FOREIGN SOURCES.

Melton Suiting.



Complete Weave.
Repeat, 64 × 4.

Warp: —3760 ends, 16 harness, fancy draw.

Reed: — 13½ × 4 = 69½ inches wide in loom.

Dress: —

1 end, 2/32's worsted, white	×3 =	6 ends.
1 end, 2/32's worsted, white and blueslate		
1 end, 2/32's worsted, white	=	1 end.
1 end, 2/32's worsted, green	=	1 end.
1 end, 2/32's worsted, white	=	1 end
1 end, 2/32's worsted, white and blueslate	=	1 end.
2 ends, 2/32's worsted, white	=	2 ends.
1 end, 2/32's worsted, white and blueslate	×8 =	16 ends.
1 end, 2/32's worsted, white		
2 ends, 2/32's worsted, white	=	2 ends.
1 end, 2/32's worsted, white and blueslate	×2 =	6 ends.
2 ends, 2/32's worsted, white		
1 end, 2/32's worsted, white and blueslate	=	1 end.
2 ends, 2/32's worsted, white	×2 =	8 ends
2 ends, 2/32's worsted, white		
1 end, 2/32's worsted, white and blueslate	=	1 end.
1 end, 2/60's worsted, blue	=	1 end.
3 ends, 2/32's worsted, white	=	3 ends.
1 end, 2/32's worsted, white and blueslate	=	1 end.
2 ends, 2/32's worsted, white	=	2 ends.
2 ends, 2/32's worsted, white and blueslate	=	2 ends.
2 ends, 2/32's worsted, white	=	2 ends.
1 end, 2/32's worsted, white and blueslate	=	1 end.
1 end, 2/32's worsted, green	=	1 end.
2 ends, 2/32's worsted, white	×2 =	8 ends.
2 ends, 2/32's worsted, white and blueslate		
2 ends, 2/32's worsted, white	=	2 ends.
1 end, 2/32's worsted, white	=	1 end.
1 end, 2/60's worsted, blue	=	1 end.
2 ends, 2/32's worsted, white	×4 =	16 ends.
2 ends, 2/32's worsted, white and blueslate		
2 ends, 2/32's worsted, white	=	2 ends.
1 end, 2/32's worsted, white and blueslate	×8 =	16 ends.
1 end, 2/32's worsted, white		
1 end, 2/32's worsted, white	×2 =	4 ends.
1 end, 2/32's worsted, white and blueslate		
1 end, 2/32's worsted, white	=	1 end.
1 end, 2/32's worsted, green	=	1 end.
1 end, 2/32's worsted, white	×5 =	10 ends.
1 end, 2/32's worsted, white and blueslate		
1 end, 2/32's worsted, white	=	1 end.
1 end, 2/32's worsted, white	=	1 end,
1 end, 2/60's worsted, blue	=	1 end.
1 end, 2/32's worsted, white	×2 =	4 ends.
1 end, 2/32's worsted, white and blueslate		
		128

Filling: 57 picks per inch, arranged thus:

1 pick, 2/32's worsted, green.
11 picks, 6 run, woolen yarn, black.
1 pick, 2/60's worsted, blue.
11 pick, 6 run, woolen yarn, black.
1 pick, 2/32's worsted, green.
47 picks, 6 run, woolen yarn, black.
1 pick, 2/60's worsted, blue.
11 picks, 6 run, woolen yarn, black.
1 pick, 2/32's worsted green.
11 picks, 6 run, woolen yarn, black.
1 pick, 2/32's worsted, blue,
47 picks, 6 run, woolen yarn, black.

144 picks. Repeat of pattern.

Finish: — Worsted melton finish, 57 inches wide.

Worsted Trousering.

Complete Weave. Repeat 40 × 4.

Warp: — 3517 ends.

Reed: — 14 × 4 = 63 inches wide in loom.

Dress: —

7 ends, 2/36's worsted, dark and medium twist	=	7 ends.
1 end, single 32's worsted, dark, twisted with 2/64's worsted fancy	=	1 end.
1 end, 2/36's worsted, dark and medium, twist	=	1 end.
1 end, single 32's worsted, dark, twisted with 2/80's cotton, light	=	1 end.
1 end, 2/36's worsted, dark and medium, twist..		
1 end, single 32's worsted, dark, twisted with 2/64's worsted, fancy	× 2 =	6 ends.
1 end, single 32's worsted dark, twisted with 2/80's cotton, light		
9 ends, 2/36's worsted, dark and medium, twist	=	9 ends.
1 end, 2/36's worsted, dark	=	1 end.
1 end, 2/80's cotton, light, 3 ply	=	1 end.
3 ends, 2/36's worsted, dark	=	3 ends.
2 ends, single 32's worsted, dark, twisted with 2/80's cotton, light	=	2 ends.
4 ends, 2/36's worsted, dark and medium twist	=	4 ends.
2 ends, single 32's worsted, dark, twisted with 2/80's cotton, light	=	2 ends.

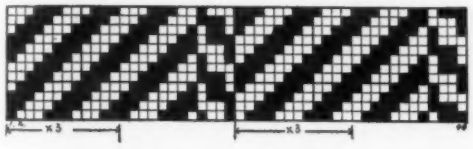
2 ends, 2/36's worsted, dark and medium twist.....= 2 ends.

Repeat of pattern: 40 ends.

Filling: — All 2/32's worsted, dark.

Finish: — Worsted finish, 54 inches wide.

Worsted Trousering.



Complete Weave. Repeat 96 × 6.

Warp: — 4118 ends.

Reed: — 16½ × 4 = 62 inches wide in loom.

Dress: —

21 ends, 2/48's worsted, medium and white, twist.
1 end, 2/64's worsted, light, double.
1 end, 2/48's worsted, dark.
21 ends, 2/48's worsted, medium and white twist.
1 end, 2/48's worsted, dark.
1 end, 2/64's worsted, light, double.
1 end, 2/64's worsted, fancy color No. 1.
1 end, 2/48's worsted, dark.
21 ends, 2/48's worsted, medium and white twist.
1 end, 2/64's worsted, light, double.
1 end, 2/48's worsted, dark.
21 ends, 2/48's worsted, medium and white twist.
1 end, 2/48's worsted, dark.
1 end, 2/64's worsted, light, double.
1 end, 2/64's worsted, fancy color No. 2.
1 end, 2/48's worsted, dark.

96 ends in repeat of pattern.

Filling: — All 2/40's worsted, dark.

Finish: — Worsted finish, 54 inches wide.

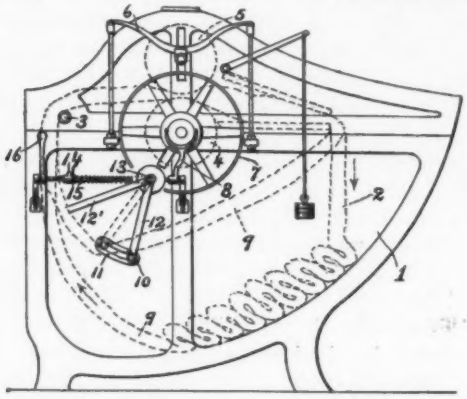
AN IMPROVED STOP MOTION FOR FULLING MILLS.

This stop motion is used on fulling mills, where low grade or hard fulling woolen fabrics are treated, and in which case the work is facilitated by running the goods under operation, in double "runs," side by side, through the squeeze rolls of said fulling mill. When the cloth is run in this manner, one run is very apt to gain on the other, resulting, in one of the runs, in the formation of a short loop, as distinguished from the long or loose loop as should be the case in both runs. This short run will soon stop the progress of the cloth in the fulling mill, but as the latter continues in its motion, the rolls of the machine will soon wear out or burn the cloth, in places where said rolls come in contact with the cloth, a feature which of course spoils the goods.

The object of the new stop motion, therefore, is to automatically stop the fulling mill when such a short loop is about forming itself in one of the runs of the fabric and thus prevent damage to the goods, the stop motion acting before the loop in question becomes sufficiently short.

The application of the stop motion to a fulling mill is shown by means of the accompanying illustration, which is a side view of a fulling mill, showing how the stop motion acts.

Referring to the illustration, 1 indicates the



casing of a fulling mill, in which the cloth 2 travels during the operation of fulling, in the direction of the arrows. As the cloth comes up from the bottom or floor of the mill, it is then guided over a roll 3 and from there between the squeeze rolls 4 and 5, the latter being in frictional contact with roll 4 by means of spring arrangement 6, said roll 4 being positively driven from a pulley 7 when the latter has a clutch 8 thrown in with it.

The runs of cloth pass between the squeeze rolls, side by side, and it often happens from one cause or another that one run will gain on the other in passing through the machine, which in time causes a short loop, as indicated at 9 to form itself, and if the latter continues to shorten, it would finally shorten said short loop of the cloth shown at 9 to such an extent as to stop the motion of the cloth, which then would remain idle, and in one place under the action of the squeeze rolls 4 and 5, which by revolving under pressure on one portion of the fabric for some time would then soon wear out or burn holes in said portion of the cloth.

The stop motion to prevent these short loops from forming is composed of a rod 10,

extending across the width of the machine and having its end in a slotted pieces 11, one on each side. Attached to the rod 10 is an elbow lever 12 and 12′ as pivoted at 13. When a short loop begins to form, it will soon become tight enough to press against the rod 10 and move it in the slotted pieces 11 into the position shown in dotted lines, thus giving also movement to lever 12, 12′ and causes its arm 12′ to move forcibly against an arm 14 fast to the shipper rod 15. This action gives a partial rotary movement to shipper rod 15 and which will take the clutch 8 out of contact with the driving pulley 7 and thus stop the machine.

When the short loop is afterwards straightened out again, the elbow lever 12, 12′ will drop to its normal position.

The stopping of the machine, when so desired for any cause whatever, for example examining condition or width of fabric, taking fabric out of the machine, etc., is done by means of handle lever 16 as also attached to the shipper rod 15, this being done without interfering with the stop motion arrangement previously described; handle level 16 in turn being also used to again start the machine.

STREAKS IN WOOLEN GOODS AND SOME OF THEIR CAUSES.

Streaks may be caused before or after the fabric reaches the finishing room, i. e., they may be caused during dressing the warp or weaving, or during one or the other of the various finishing processes. In a streaky cloth, where said streaks are not those due to difference in color, the cause is frequently found in the cloth before the latter reaches the finishing room, being caused possibly either by a difference in twist or tension on the warp threads, both items being possible sources of streakiness to fabrics; again the material in itself may be the cause. The matter of irregularities in tension when the warps are dressed on the loom may be apt to cause such a variation in the face of the cloth that in turn the fulling mill may produce streaks; however, this sort of streakiness will not appear prominently unless we deal with a double and twist yarn, light and dark colors twisted together, etc. There the variation will be more apt to cause a change in shade, whereas in connection with a solid color or on an ordinary yarn, no variation would be noticed. If a yarn has any tendency to be unevenly twisted, or to be heavy and light in places, there is the same liability to streakiness when such a yarn gets into the warp.

However, the most interesting moment for ascertaining the cause of streaks in woolen cloths arrives when the latter reaches the finishing room and where we find the first and great place where streaks are liable to form, in the fulling mill. In connection with this machine, the warp constituting the cloth, the flocks, or the operation of fulling as carried on, may be the cause of the streaks. For example, if the soap is poured out of a spout on the goods, and if in turn we deal with fabrics which require only little fulling, this pouring out of the soap may have a tendency to result in streaks during the felting of the fabric.

If the goods are allowed to run in folds and remain there during the fulling operation, and if the latter is quick, everything is favorable towards the production of these streaks, especially if we deal with fabrics requiring flocking and where a streaky appearance may result in the cloth, for the fact that the flocks will act mainly along the line of soaping, and when said soaping is done in the shape of streaks to the cloth, naturally the flocks, thus following said line, are apt to cause trouble.

In connection with fabrics requiring little fulling, it will be advisable to alter the position of the cloth in the fulling mills, from time to time, in order to avoid chances for streaks.

However, one of the most frequent causes of this trouble is the bunching of the goods lengthwise in set folds or creases, and when these creases are not moved or straightened out until it is too late to do away with them. In this way those parts of the cloth which are in most constant contact with the friction pulleys and sides of the mill, and which are most exposed to the felting influences, are liable to show up in different shades from the other parts of the cloth, and the appearance will be in the shape of streaks or uneven or incompleted fulling. For this reason, in order to remedy any tendency towards streaks, soap must be applied uniformly, flocks in the same

way put on over the whole fabric evenly, and whenever possible, the cloth should be frequently opened by the operative, so it has no tendency to run in continual folds.

We now come to the washer, and where a defect in the operation of this machine will frequently lead to streakiness of the cloth under operation. Bad or worn out guide eyes for the cloth to go through, bad or worn out rollers, etc., all will tend in the direction towards possible streaks, and are items which must be carefully watched and remedied. It will be frequently noticed how the dirty soap suds roll back upon the goods as they pass over the rollers, and these long streaks of dirty water and suds must leave an appearance of streakiness to the fabric if the whole is not thoroughly removed in the rinsing. But here, as well as in many other processes, the great cause of streaks often lies in defective seams at the sewing together of the ends of the pieces. A bunchy seam will always tend to form streaks, not only at the ends of the piece, but even, at times, far into the goods. They must be avoided at all stages.

With reference to the process of gigging and steaming, the tension on the fabric under operation calls for care, since if the fabric is not uniformly stretched, if the fabric is not handled with a uniform tension, or if the rollers are worn out, etc., streaks are apt to appear during these operations.

Care must also be bestowed on the shear, the brushes must be all right, and if worn must either be clipped down or renewed. The brushes on the shear and press frequently are at the bottom of forming streaks to the fabrics, and for which reason an economy in using them as long as possible, instead of replacing them by good ones, will be a false one.

POINTS OF ADVANTAGE OF COTTON TO WOOLEN AND WORSTED FABRICS.

Although it shall not be the object of this article to push the application of cotton into the construction of woolen and worsted cloth, yet for the fact that the cotton fibre is and will continue to be used extensively in connection with woolen and worsted fabrics, a notice of the points of advantage of this procedure cannot help but be of interest to the reader.

One of the main objects in using cotton in connection with the woolen and worsted trade certainly is found in the present rage for cheapness of woolen and worsted clothing. However, there are many instances where a little cotton, if used judiciously, is of great advantage to a fabric composed mainly of wool. For example, the non-shrinking properties of cotton can be utilized in fabrics, which, unlike the ordinary run of dress goods and suitings, require considerable washing. Most of this class of fabrics are composed entirely of cotton or in the case, for example, underclothing, a majority of people prefer for health and comfort to wear woolen next to the skin. If in this instance using an all wool structure, it will follow that it is an expensive feature, for the fact that such underclothing, with each successive washing, will shrink in size, becoming in a short time too small for comfort, and finally for use. Certainly if we would deal with a coarse wool fibre, this shrinking property would be less pronounced, but in that instance the coarse fibre would be a discomfort to the wearer. To overcome this disadvantage of shrinking, in connection with "all wool underwear," a mixture of cotton and wool will be preferable to the pure article in most cases. However, this affair of mixing cotton to the wool fibre can be overdone, and it is not the object of this article to thus inspire the manufacturer; for example, take all wool flannels, and where at present, thanks to the improved construction of our nappers, cotton is so extensively added that in many instances it is hard to find the wool fibre in the fabric. For reason mentioned before (shrinkage), a certain amount of cotton certainly should be added to these all wool flannels, using about 5 per cent. in the best grades, i. e., just enough to check shrinking, whereas in the average grades the amount of cotton present is and may be increased up to 30 per cent., and this as a rule without hurting the general character of the fabric in question.

Cotton being capable of being spun considerably finer than wool or worsted, its introduction when dealing with a hidden

thread in the structure may be found of no disadvantage to said fabric, in fact advantageous. A good example of this is found in chenille fabrics, and where the core or body of the chenille fabric is always cotton. The same is the case in connection with many double cloth structures, overcoatings, cloakings, etc., and where a fancy back is woven into the fabric. In connection with such structures, it then would be impossible to produce a perfect fabric without the back showing through, provided we would proceed on the regular double cloth principle—interlacing back warp and filling in constructing these fabrics. The fancy colors of the back would always show through more or less on the face, a feature well known to any designer or manufacturer of these classes of goods. A fine cotton thread, what we technically call an extra binder warp, in this instance will greatly help to unite the fancy back to the face structure without causing the fancy back to show through on the face more than absolutely possible to be prevented. The fine cotton warp in this instance being more or less buried in the structure of the all wool cloth, will not depreciate the fabric, in fact for the reason stated before assist in producing the best possible structure under these circumstances, it being another necessity to use cotton in connection with all wool fabrics in this case. This extra cotton binder warp not only helping to prevent the fancy colors of the back from showing through on the face of the fabric, at the same time will assist to produce the firmer cloth, caused by its frequent interlacing between the face and back structure, a feature which in connection with lower grades of these fabrics will be an additional advantage, resulting in a firmer handling of the structure.

The crabbing properties of cotton can also be utilized in many cases, although this is more applicable to union cloths, where the materials are nearly equal in quantity. There are, however, many cases where the greater proportion is wool, as in some makes of Sicilians, twilled linings, Italians, etc. In the first case, it would be impossible to make a bright, clear, lustrous Sicilian with wool warp, simply because it could not come through the crabbing or setting process in the finishing, with as clean, straight a thread. Also in the latter two cloths, a cotton warp could not be improved upon—in fact could not be replaced,—and at the same time retain the brightness, gloss, handle, firmness, etc., in the cloth, imparted in the crabbing process. In the before mentioned cloths, and in many others, a stiff, slippery handle, accompanied by lightness, is necessary for the use for which the cloths are destined, and they fulfil a part which could not (apart from cost) be better played by fine, pure wool fabrics.

At the beginning of the article we referred to one of the reasons why cotton is more or less introduced in woolen cloth for the sake of cheapness, a feature which not only refers to the raw material itself, i. e., at the outset, but at the same time to the various processes the fibre passes through in converting them into yarn, and which are processes all much cheaper than the required ones in woolen yarn, at any rate worsted yarn; and if required in dyed yarn, the dyeing for the majority of colors is again somewhat less than for worsted or woolen.

With reference to designing or cloth construction there will be any number of fabrics found which could not be conceived otherwise than containing portions of cotton. The clearness which can be obtained in fine counts of cotton makes it universally used in the formation of gauze or net stripes where a contrast of density is required. For example, take a striped cloth formed of alternate stripes of solid and net. The solid part is formed of a dense satin, or perhaps a plush stripe, whilst the vacant stripe is composed of a fine gauze. The desired effect is that to the casual observer the solid stripes should appear in strips, as it were, disconnected with each other. This netting or gauze part is invariably made of fine cotton, although in the more expensive goods silk is used.

In some classes of cloth it is required to bring up a design very clearly raised above the ground. Here the rigidity of cotton generally plays an important part. This applies to many classes of mantle-cloths matelasses, crinkle-cloths, and other goods of similar description.

An important feature the cotton fibre plays

in connection with all wool fabrics, i. e., its advantages in that instance, is the cheap easy and effective manner in which color effects may be obtained in connection with certain fancy fabrics. In this instance, the designer has a chance to make use of the fact that not every dyestuff acts directly on any fibre. The fibres have in this instance to be previously prepared by a certain mordanting process in order to receive such dyes, and when a very large variety of colors and shades can be obtained with the same dyestuff by simply using different mordants; again different mordants are required for cotton than for wool, for which reason a union fabric, i. e., a fabric constructed partly of wool and partly of cotton, were mordanted for wool and afterwards dyed, then the cotton fibres would remain perfectly white, or the affair might be reversed, producing in this manner a great many fancy effects, all based upon the previously referred to principle.

Good mixtures for fabrics may be obtained by using union yarns i. e., yarns in which cotton and wool have been mixed previous to carding or combing, and then piece dyeing the fabric with a wool mordant. The yarn in this instance may contain more or less a greater or smaller percentage of cotton, according to the mixture required. For example, a gray mixture may be obtained by using 50 per cent. of wool and 50 per cent. cotton, a darker gray by using 70 per cent. wool and only 30 per cent. cotton, and so on, until finally getting a dark Oxford shade by using 95 per cent. wool and 5 per cent. cotton respectively, piece dyeing in either instance the fabric for a black or blue black as the case may be. Certainly other shades or mixtures could be obtained on similar lines of mixing, all being composed of color and white, fancier shades being obtained by means of cross dyeing. A good example for a figured dress goods in this instance would be to use a union warp composed of 50 per cent. wool and 50 per cent. cotton in connection with a union filling composed of 70 per cent. wool and 30 per cent. cotton, then interlacing warp and filling by means of a fancy weave (Jacquard or Jacquard imitation effect). After such a fabric is then dyed, the design will stand out in a neat subdued way from the ground, in this manner providing an endless chance of novelties for the designer.

Shaded checks, stripes, or figures can also be obtained on this principle, by employing yarns of either two or more degrees of mixing.

In connection with fancy worsted trousering we very frequently will find fine cotton threads introduced in connection with union twist yarns, i. e., where the body of the yarn is wool the cotton being used is a fine thread twisted with said woolen yarn, resembling, i. e., being placed there in this instance to take the place of a silk thread as originally intended to be used. If a cotton thread in this way is carefully handled, it might be used with advantage with reference to cheapening the construction of a fabric, the cotton appearing in this instance in such small but distinct quantities, that in the cloth it is more or less impossible to distinguish the twist from silk. The affair may be used either in connection with piece dyed or yarn dyed structures.

With reference to cross dyeing union cloth, the affair mainly refers to fancy dress goods, either plain or figured, and in which instance one set of threads—the warp—is cotton and the other set—the filling—worsted. In dyeing, the cotton warp is dyed to the required shade—a good firm shade equal to stand the cross dyeing process as necessary for dyeing the filling later on to another shade. Another way is to mordant the warp and filling so that during dyeing each system of threads is affected differently, and consequently turns to a different shade. This procedure does not afford as large a variety of shades as the first process, although an unlimited combination of effects may be produced by it, for the fact that by this method warp and filling can be dyed in many instances to entirely opposite colors.

In the time of Homer the art of weaving was considered an accomplishment worthy the efforts of royal princesses.

Embroidery was practiced in Egypt before the exodus of the Israelites, and gold and silver threads were used in weaving 4,000 years ago.

CORRESPONDENCE AND NOTES

Upon Textile Topics at Home and Abroad.

LENO CLOTHS.

BY WILL NELSON,
Head Instructor in Warp Preparation and Weaving, Lowell Textile School.

(Continued from April.)

There are two distinct kind of dobbies used in the making of leno cloths, the single lift and the open shed dobbies. We have learned from the previous articles that a leno stripe is formed by the use of an additional half-harness made in the form of loops through which the leno threads pass, and that those threads pass to the right, then to the left of the ground threads. It will be readily seen that if the harnesses are raised from the bottom every pick to form a shed for the shuttle to pass through this would be the simplest and the best way to make leno cloths, for then the doup would lift straight every pick without the possibility of snarling. For this reason we consider the single action dobby the better of the two for lenos of the hemstitch or lace order.

Most cloths of the net order can be made on any kind of dobby because there is generally one or more picks placed in the cloth between the lifting of the doup for the plain pick and the lifting of the doup and standard for the crossing pick. The odd pick passes in between the working of the doup, allowing the doup to be at rest. When the time comes for the doup to work it is drawn straight from its position so there is no fear of snarling. Lenos of the lace order can be made on the open shed dobby only by the aid of additional appliances. This is because there is an immediate change from the lifting of the doup to the lifting of the doup and standard That is, the doup may be lifted for one pick and the doup and standard require to be raised for the next pick. This means on an open shed dobby without additional appliances that the doup shed would have to be pulled say from the top shed on the right hand side to the top shed of the left side of the ground thread. This takes place while the harnesses are changing, which cannot be done without the doup snarling in the yarn to a greater or less extent.

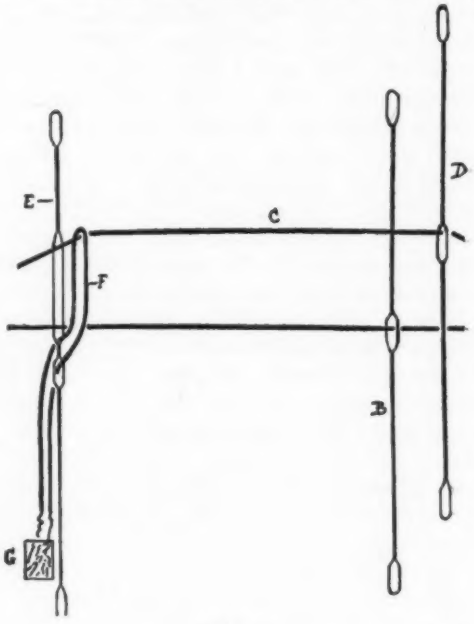


FIG. 1.

Fig. 1 shows the position of the doup for the open pick and it will readily be seen that the snarl shown in Fig. 2 is due to the fact that the doup shaft, G, is kept in the same position. The arrows indicate the way the harnesses are working. G and D were lifters for the previous pick; for this pick D has to be down and the doup, G, at F has to be on the other side of the thread, A, the standard harness, E, pulling the doup to the other side. The objection to the snarl forming at F will readily be seen. To overcome this seri-

ous defect and make the harnesses work as nearly as possible as if they were actuated by a single lift dobby two motions are added. They are the shaker and the half motion or double yoke attachment. There are several kinds of shakers (sometimes called jumpers),

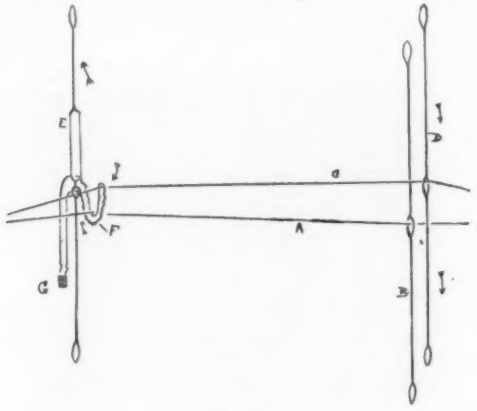


FIG. 2.

but as all perform the same function the description of one will be sufficient.

Fig. 3 shows one that is used very extensively. A small shaft is placed across the top end of the machine and on this shaft the segment, A, is fixed. The segment has as oscillating movement through the action of the two levers, B and C. The rod, D, is fitted to an extension fitted to the back rocking arm of the dobby. When the levers are straight, as shown by the dotted lines, the ground thread harness is raised to about the center of the shed, at the same time the standard harness is raised and the doup shaft through the action of the double yoke is descending until it meets the eye of the standard. This occurs about the center of the shed. This arrangement prevents the snarling of the doup. The ground thread is raised to the center or a trifle higher as the doup and standard meet. All the standard has to do is to pull this doup to one side and lift it up straight. The shaker is always attached to the ground thread harness and is so timed that the harness is raised as soon as the shuttle has cleared the shed. The shaker completes its work before the shuttle starts for a pick. The height of the harness can be varied by having the strap tight or loose, care being taken that the harness raises high enough to allow clear crossing of the threads when the crossing pick has to take place. It must not be too high for if this occurs the filling is either curled in the outside stripes or it is cut, either fault making a very poor piece of cloth. The height of the harness is governed by the height of the shed. When the harness is at the bottom of the shed it is better to have the shaft, E, on the segment for one inch at least. If much less than this, the strap is pulling directly on

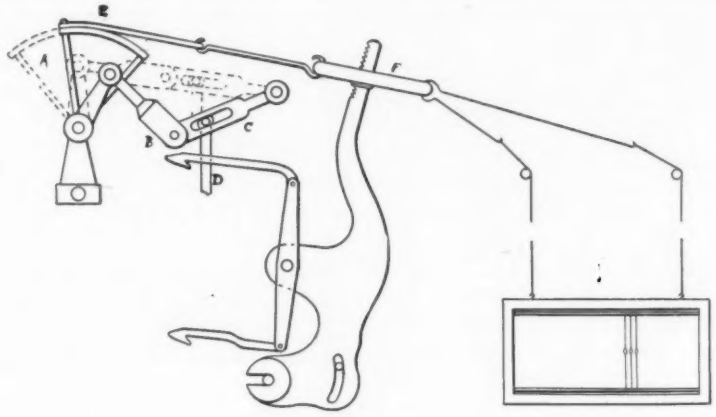


FIG. 3.

the screw with the tendency to pull out the screw or rip the leather. The strap for the segment wants to be in line with the harness lever, otherwise the brass slide which passes over it will bind and prevent the harness from dropping to the bottom shed. The result is a breaking of threads.

The double yoke or half motion attachment is shown in Fig. 4. In a good many cases the harness yoke is operated by the two harness levers, two being used exclusively for the lifting of the dobby. The double yoke is a

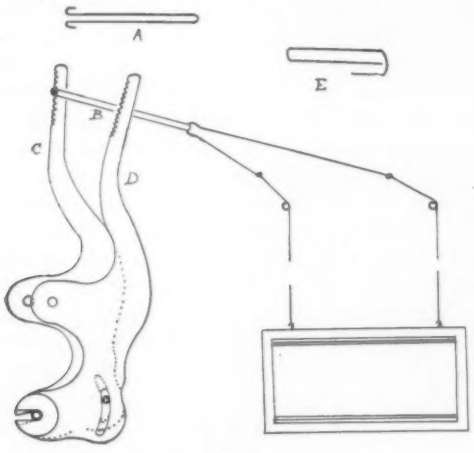


FIG. 4.

length of wire formed like a double hook, A, and is placed in between two harness levers, B, one of the hooks is caught on the lever that is raised. The pattern chain is so built that when the standard harness has to be lifted the peg for the lever which is now raised is left out of the chain and a peg is placed in the chain that will lift the harness that is down. As the lever, C, is descending, D, being raised, will come in contact with the other hook of the double yoke at the same time the standard harness is being raised. The action of the double yoke causes the doup and standard to meet in the centre of the lift.

When the pattern to be woven requires the full capacity of the dobby only one lever is used to operate the doup. One hook of the yoke catches the standard harness lever and the other engages with the doup harness lever. The same motions are performed as

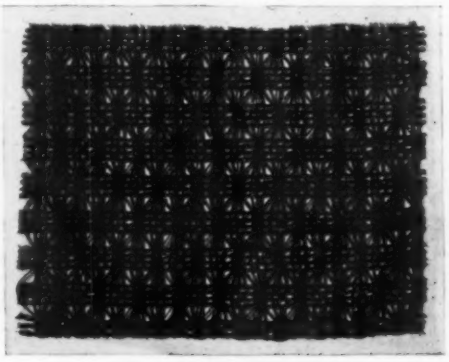


FIG. 8.

previously mentioned. E shows a very simple half motion attachment. This is pieced to the standard harness lever and the particular bar in the chain that has to raise the standard is without the usual doup peg so that as the standard harness is lifting the doup lever is going down. It comes in contact with the hook on the standard lever and will be drawn up by that hook which of course means the doup will meet the eye of the standard and snarling of the doup is prevented.

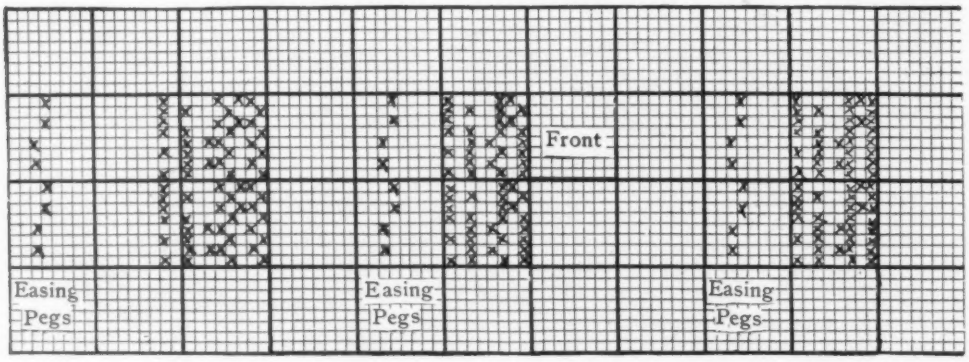


FIG. 5. FIG. 6. FIG. 7.

Figs. 5 and 6 show how to build the chain for the cloth, Fig. 8, which is an all-over leno effect. Fig. 5 shows the double yoke on two separate harness levers. Fig. 6 shows the yoke controlled by the regular doup and

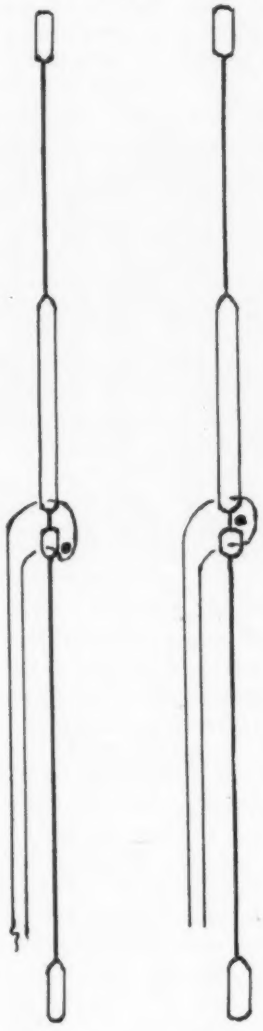


FIG. 9. FIG. 10.

standard harness levers. Fig. 7 shows the pegging plan for a single lift dobby. The patterns are repeated twice, eight picks being one repeat.

Great care is necessary when a leno pattern has to be started in a loom. Carelessness in setting the doup means the difference between the doup lasting until the way is finished or constantly breaking before half a piece of cloth is woven and sometimes being replaced when several pieces have been woven. There are also the loss of production from a loom and additional work for the piecer and second hand. If the doup is carelessly set at the starting of the warp nothing can ever make it work as well or last as long as it would have done if rightly set. The doups are very easily stretched and single strands in the doup yarn broken. It is the aim of good piecers to set the doup so that when the standard and doup are raised the crossing or leno thread will not weigh down the loop, but will rest easy between the two eyes of the standard heddle. This is the secret of good leno fixing and weaving. A glance at Figs. 9 and 10 will readily show the advantage of one over the other.

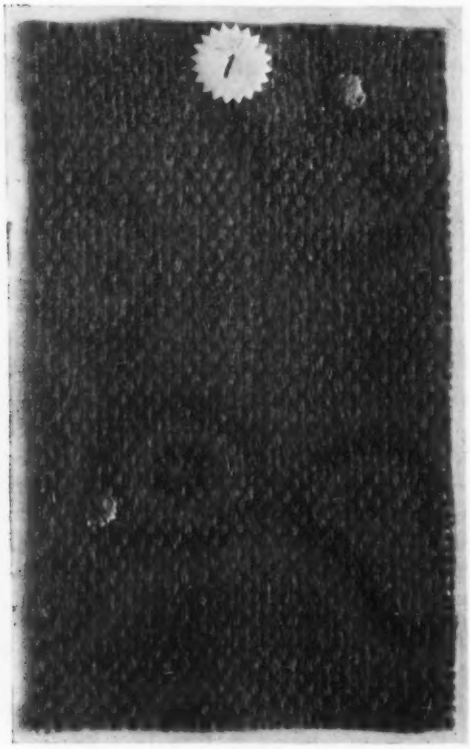
ENGLISH NOTES.

(From our Special Correspondent.)

Very hard markets have been making business as difficult and unprofitable as can well be imagined. The resistance against successive advances in wool is at the highest pressure. Buyers of Botany stock are especially disinclined to pay living prices. The demand for their goods is lighter, even proportionately, than for crossbreds. Concerns that managed to run during a slack period at a lower market level are now faced with no alternative save the stoppage of some machinery. The merino business on offer is at less than cost rates. Crossbreds enter into so wide a range of goods that the occasional possibilities of a profit are more frequent. In that market, too, there is more faith in the future.

Wool merchants interested in the English clip have prayed in vain for a general fall of one penny. Their wools are yet to be bought and country holders know so much of the price of colonial material that the prices they make are out of reach. To middlemen in this trade the season is bound to be one of pure speculation. They must play blindman's buff, in the trust that growers' necessities will eventually lead to some cheaper parcels.

Certain woolen firms are profiting by the war. The Japanese government has placed large contracts for blankets and for khaki serges. One large Dewsbury mill is running double-shifts in order to keep to the time limit. With the khaki, similar troubles to those experienced by our own government have appeared. Before shipment the goods are tested in Liverpool and a considerable quantity of the lots tendered have been re-



jected for want of strength or for imperfect dyeing. Only a few of our woolen firms have made a signal success in these serges and a few blocks of "rejects" make all the difference to the contract. Trade with Japan is jeopardized by the new tax which makes the import duty 25 per cent. ad valorem.

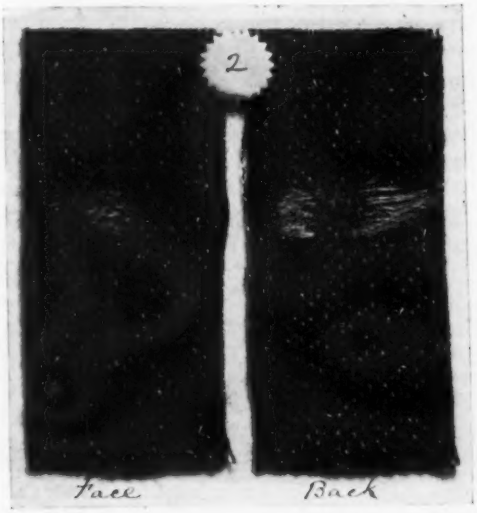
A small failure in the top trade shows that speculative financing is not yet dead. By propping up men of straw some important disasters have been brought about in years past, to the detriment of more legitimate enterprise. A Bradford comber, topmaker, or even banker suggests to some salesman that he should buy wool at the London sales. A credit is opened and the beginner is charged with interest at 5 or 6 per cent. for the loan. When the wool is delivered it enters into the possession of the financier and rests there until sold. The arrangement thus far is not open to much reproach. Supposing the market to go with the speculator both parties may do well. If the reverse be the case, and the tops are only salable at a loss, it is not the financier who loses. Elaborate care is taken to find other creditors to stand the deficiency. And in some gross cases the whole course of prices has been demoralized by the reckless underselling of men who are doomed to certain failure, to the general detriment of business.

Failures, on the whole, have been notably few. A large number of commission dyeing firms have followed each other into liquidation and extinction. But this disappearance is equally due to the pressure of the combines and bad trade. A more significant matter is the failures among firms engaged in weaving medium fancy worsted goods. First and third-class goods have had a checkered experience, but they have not suffered the fate of those who have endeavored to make fine, solid worsteds upon heavy looms at low prices. The breakup of Jno. Carter & Co. of Dunkirk, Halifax, is the latest instance to emphasize a general trend. Formerly the firm was well known to American buyers. Now its machinery has passed piece-meal to other works and the building to another trade. The moral might be pointed by reference to a dozen other firms that met a similar fate. The lesson to be extracted is that there is no halfway now in men's worsteds. There is room for the best Huddersfield goods at high prices and for cheap stuff from fast looms, but none at all for those who shirk the heavy expenses of designs and patterns and seek to compete with those who do not and who charge prices in accordance.

Embroidery of plain dress cloths is somewhat of a rage now. Amazons, hopsacks, voiles, crepes de chine and so forth are all being tamboured with a silk spot, lozenge or tiny leaf. The operation is done by hand upon frames made for the purpose. The

knot is tied behind and the current price for the process is 6 pence per yard of 44 inches. One style of these goods is shown at Fig. 1.

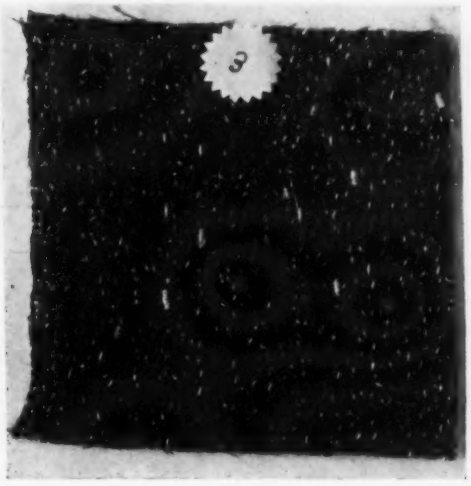
A winter novelty in heavy dress tweeds, or ladies' suitings, as they are now called, dispenses with the hand sewing. A spot or ball of 3/8-inch diameter is put in as extra filling.



Instead of carrying these threads on the back, the floats are cut and the loose ends of the picks are left projecting from the back of the fabric. Bright colors are used and an air of distinction is given to a commonplace ground-style. Denby & Co. of Shipley are the originators of this idea in a cloth at 44 cents, Fig. 2. Another from the same source is a Curl cloth, Fig. 3, woven into diamond shaped knots, which show a broad diagonal in either direction. In the filling a plain, hard thread alternates with a firmly twisted fancy slub yarn. These two appeal to a good class of trade; the price of the curl cloth being 38 cents.

Following men's styles a certain number of costume cloths are appearing in checks and overchecks. The overchecks are somewhat large, having a side of 3 or more inches and as the thread is often of bright boucle mohair in strong colors they are sufficiently conspicuous.

Experimenters in ramie may be interested to learn that 2 and 3-ply yarn for incondescent gas mantles is in good demand at present at 60 cents (or half a crown) per pound, while the price of good top has increased 3 pence and is hence 38 cents (or one shilling and ninepence). Further advances are possible as the London market is bare of raw supplies and certain would-be contractors have had to postpone operations indefinitely. People who should know are saying that German producers are utilizing ramie in conjunction with silk to make gimps and miscellaneous decorations for upholstery. It is not said that the latter branch is as lucrative as working for the Welsbach, Veritas, and other mantle-making companies. Prohibitive rates are making it impossible to sell ramie for



sail-cloths and kindred rougher uses. Brokers, in view of the erratic course of ramie in the past, are loath to encourage planters to sink capital in cultivation. Thus there may be, at present, an exceptional opening for any American ramie.

Palm oil is obtained from the fruit of several varieties of palm native to the west coast of Africa.

Window glass came into use in England for houses during the reign of Elizabeth. Records of the York cathedral show that in 700 A. D. "glass was placed in the windows so that birds could no longer fly in and out and defile the sanctuary."

A WOOL CARD WITH EXTRA CYLINDER.

The accompanying illustration, Fig. 1, is a sectional view of a woolen card resigned by Arnold Braun, Hergenrath, Germany. The stock passes through the main cylinder, a, and through a series of workers and strippers in the usual way. It is raised by a fancy, c,

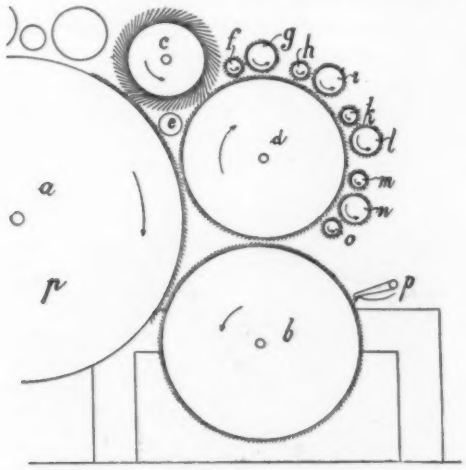


Fig. 1

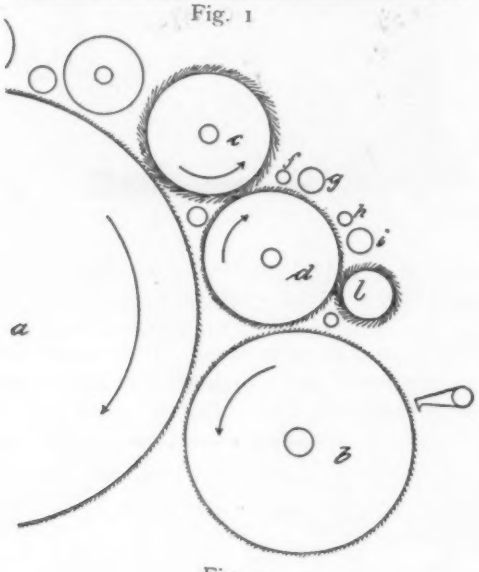


Fig 2

and then passes to the extra cylinder, d, which is equipped with the workers and strippers as shown in the illustration. The doffer, b, is adjusted to strip the stock from the extra cylinder, d, and also from the main cylinder, a. The material is then combed from the doffer in the usual manner. The improvement claimed for this card is the use of the workers and strippers on the extra cylinder, d. This cylinder is in reality a doffer and the double doffer system of carding corresponds and has been in use in Germany for a number of years. It has been found, however, that the two doffers enable a much larger amount of stock to be passed through the card than could be properly carded, and it is to overcome this difficulty that the workers and strippers have been applied to the upper doffer, d, by Herr Braun.

Fig. 2 is a modification of the Braun card on which the fancy, f, is placed on the extra doffer, or cylinder. While this reduces the number of workers it facilitates the passage of the stock to the doffer, b. It is claimed that the Braun system increases the production of a woolen card from 25 to 30 per cent.

AN IMPROVED SHUTTLE.

When the shuttle is brought to a sudden stop in the box, the momentum often causes the bobbin or cop to slide on the spindle and unwinds more or less yarn which is liable to form into kinks. In some cases the yarn is thus broken. A native of Lodz, Russia, has devised a shuttle for overcoming this difficulty and recently secured an American patent for it. The spindle is arranged to allow the cop to slide under the influence of the impact and to return immediately to its original position. The inventor states that the spindle, shown at Figs. 1, 2, 3 and 4, comprises a tapered shaft having a head of U-shaped cross-section. The flanges of this head are connected by a cylindrical body having a central aperture adapted to fit over the pivot or pin of the shuttle around which the spindle is turned in the ordinary manner whenever it is necessary to exchange the spool. A coil-spring is wound around the body, one end being attached to the web connecting the flanges of the head, this web being preferably cut away in part to give room to the body and the windings of the spring, the other end of the spring being connected to a link, which turns on a hinge of a collar forming part of a sleeve, adapted to

slide longitudinally on the shaft. The sleeve is longitudinally slotted and bent, as shown, presenting frictional springs in the same manner as the cores used in connection with spindles of spinning-machines. The cop carried by the sleeve will undergo a limited

Fig. 1.

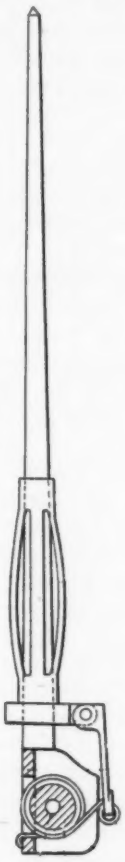


Fig. 2.

Fig. 3.

Fig. 4.

longitudinal displacement jointly with the sleeve, thereby tensioning the spring, which will return the sleeve and the cop immediately into original position.

The spindle as described can be used in ordinary shuttles in place of the old spindle by simply placing the body upon the pivot, no change being necessary for the shuttle.

The improved spindle is lighter than the spindles usually used; hence by using it the wear and tear of the weft is not increased. The displacement of the sleeve caused by the shuttle striking against the shuttle-box or by the workman taking the cop off is controlled by the end of the spring attached to the link.

It is easy to calculate the diameter of the body, Fig. 3, so that the maximum possible contraction of the spring will not exceed the limit of the elasticity of the spring (for a desired number of contractions within a unit of time), and consequently to provide a spring which will preserve its elasticity indefinitely. The flange or collar of the sleeve is made of a diameter sufficiently large to permit the workman to grip the collar with the fingers and to remove the cop, the spring remaining inactive. This is, however, a secondary consideration, since the extent of the contraction of the spring being limited this removal may be effected an indefinite number of times without injury to the spring whenever the sleeve is not retained by the hand. From the permanency of the elasticity of the spring it follows that the sleeve when displaced from the normal position will return into it each time with the same force, the extreme inner end of the sleeve being violently thrown against the head. Owing to this the cop carried by the sleeve is forced back to its initial position whenever it has been displaced.

Warp Take Up. The Draper Co., Hopedale, Mass., have adopted an improved high roller take-up for their loom. It allows for a greater length of cloth from the reed to the roller and also the direct passing of the cloth tc the roll when desired. The cloth roll is given extra capacity for vertical movement so as to bring the strain upon either the top or the bottom shed. A gear has been added to the take-up roll shaft and meshes with teeth cut on the cloth roll so as to give it a positive rotation when winding the first few layers of cloth.

Angola is the name of a light fabric made of the hair of the Angora goat mixed with fine merino lamb's wool.

A CRANKY LOOM.

BY DAN READY.

While working as a spare fixer in a mill where I had worked for a number of years, the management decided to install some two shuttle drop boxes. Instead of having new lays they decided to use the old ones by sawing off one of the boxes and attaching the new boxes in its place. This work was intrusted to the mill carpenter, who made a pretty good job of it. The rest of the work was done by spare fixers. Being a spare fixer myself I had a chance to work on every one of the looms that were so changed and so I became familiar with them.

One of the looms that was changed did not run very well. It would take fits, and run all through the diseases that a loom is heir to before it would settle down to a week's work. Nearly every fixer in the mill had tried his hand at fixing it, but it simply refused to be fixed to stay. The fixer on whose section it was came to the conclusion that it could not be fixed without a new lay, as he seemed to think all the trouble was in the boxes. Finally he left and the section was given to me, and the first job I got was on this particular loom.

At this time it was having its periodical fit of "banging off." The weaver told me that when I cured that it would begin to throw the shuttle, then it would cut the filling and finish up by breaking out the yarn before settling down for a few days' work. On looking the loom over I found it was picking too early; in fact, the shuttle was entering the shed before the latter had formed. I found also that the picking stick was pulled up to the limit. I set the cam back, putting it a trifle late, as I have found I get better results this way than by having it just on time. I also let out the lug strap and eased up the shuttle boxes, and had no more banging off. The loom ran about a day when it started to cut the filling on the shipper side. For this I tried everything I knew, also everything that any one suggested, but all of no avail and I had to report to the second hand that I was stuck.

The second hand, being an old box loom fixer, said that he would have a look at it and see if he could not fix it, so he went down to the loom and examined it all over. He said I had done about everything that would stop it from cutting the filling and he could not see that much more could be done. He said I might put on a new picking stick as the old one was probably cracked, and if so that would cut the filling. I put on a new stick and started the loom, when it ran off a whole cop, so thinking it was all right, I went away. A little while afterwards I saw the second hand working at it again, but being busy I did not go to him. He worked about two hours and when he left it was still cutting the filling.

When I got time I went back again resolved that it should be fixed or I would ask for a new loom. While watching it running I noticed that the rocker, which was of the "nigger foot" pattern, had a little play in it. I put in a new plug and it never cut filling any more.

I had one more tussle with the same loom before I got the best of it and that was for breaking out the yarn. There was a spot pattern on it at the time woven with two warps on twenty-two harness. The bottom warp was 40's yarn and the top 80's. The spot where all the breakage occurred was from the top warp, and the filling that made the spot was floated under the cloth, so that when the spot was being formed all the harness were pulled up with the exception of one or two. This made it extremely hard to get the spot threads to "bottom" sufficiently to give the shuttle a clear passage. I lowered the whip roller as low as I could, but that did not help me much, so I took some string, put it round the middle of the front lease rod and made it fast to the floor. This held down the yarn when all the harness were up so that I got as good a shed as when weaving plain. This was also the last difficulty I had with that particular loom.

The value of the cotton goods of domestic manufacture exported from the United States for the year ending June 30, 1903, amounted to $32,216,304. The value of the cotton goods exported from Great Britain for the same period amounted to $271,418,227.

MACHINE FOR CLOTHING CARD CYLINDERS.

Machines for applying card-clothing to cylinders as heretofore constructed embody means for mounting and turning the cylinder to which the clothing is being applied, a traveling carriage movable lengthwise the cylinder for guiding the fillet or length of card-clothing which is being applied to the cylinder, means for exerting a tension upon it and for varying said tension, and for automatically ascertaining the degree of tension. The carriage-driving mechanism is adjustably connected with that turning the cylinder, so that the travel of the carriage may be varied to correspond in the necessary way with the surface speed of the cylinder.

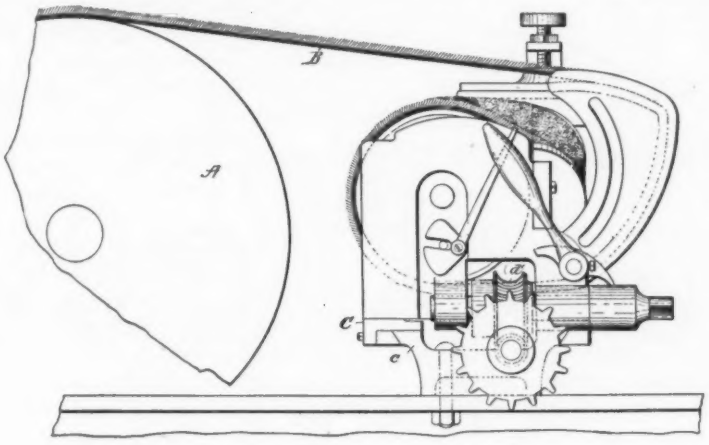


FIG. 1.

The machine shown at Figs. 1 and 2, and recently patented in this country, is designed for feeding or actuating the carriage. Heretofore this has consisted of a long screw of about the length of the cylinder to be covered and rotated from the cylinder-turning devices, and a worm-wheel mounted upon the carriage to engage the thread of the screw and adapted to be clamped stationary to the carriage to permit the carriage to be fed by the screw and to be released to enable the carriage, after a feeding movement, to be returned to its initial position. The inventor of the new device states that this feeding mechanism was located at the forward end of the carriage, and it has been found in practice to be undesirable, because the engagement between the worm-wheel and the screw is limited to two or three teeth of the wheel and because of the location of the worm-wheel upon the carriage and because of the large strains to which the screw and worm-wheel are subjected, the practical effect being to soon destroy the worm-wheel and to injure the screw and cause the carriage to travel hard and irregularly. The worm-wheel is still used, however, as a means for returning the carriage after a feeding movement to its original position. This use does not subject the worm or the feeding-screw to strains and does not affect the operation of feeding the card-clothing, so that the use of the worm-wheel for this purpose is not objectionable.

For feeding the carriage there is employed a long nut, which is attached to the carriage near the centre of its length and in such a manner that it may be readily engaged with the driving-screw; when engaged with the driving-screw it does not bear against the frame of the carriage and thus relieve its holding and supporting mechanism from strain. By a carriage-feeding mechanism of this organization the connection between the carriage and the driving-screw is obtained at a desirable point with respect to the length of the carriage and the strains to which it is subjected; the work is distributed upon a considerable length of the driving-screw, and

the wear upon the nut instead of being confined to two or three threads is extended to a large number of threads, which are shaped to the curvature of the screw and are not reversely shaped with respect to the screw as are the threads of the worm-wheel.

Figure 1 is a view in end elevation of the carriage, also showing a portion of a cylinder to which card-clothing is being applied. Fig. 2 is a view principally in front elevation of

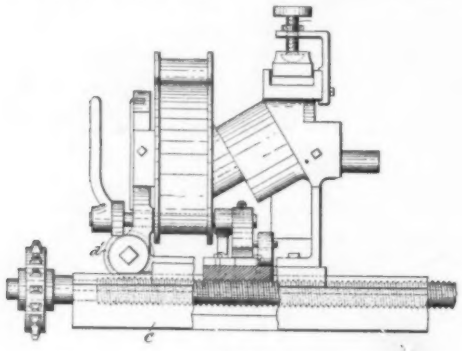


FIG. 2.

the carriage and carriage-stand. A represents a cylinder of a carding-engine mounted in the machine, to be turned by mechanism not shown. B represents a fillet or length of card-clothing running from the carriage. C is the carriage. It is mounted in the usual way to slide upon the carriage-stand, c, which extends crosswise the machine and so that the carriage may be slowly moved lengthwise the cylinder while the card-clothing is being wound upon it, the feeding movement of the carriage being about equal to the width of the fillet or length of card-clothing for every full revolution of the cylinder A.

The operation of the invention is as follows: With the carriage in its initial or starting position and attached to the driving screw to be fed thereby, the threads of the carriage-nut are in engagement with the threads of a long section of the screw, and the nut is held locked in such position. Upon the starting of the feeding movement of the carriage the nut is immediately caused to come in contact with a portion of the carriage beyond it and is held in such position by the strain of the card clothing or fillet upon the carriage, which often amounts to two or three hundred pounds. The carriage by the slow rotation of the driving screw is then slowly fed while the card-strip or fillet is being applied to the cylinder. When the carriage reaches the end of the feeding movement, it is unlocked and lifted from its engaging relation with the driving-screw and to a position entirely free or detached from it, where it is automatically held by the action of the lifting mechanism. The carriage is then free to be returned to its initial or any other position at any speed required and one not dependent upon the speed of the driving-screw by turning the worm-wheel, d', which is in constant engaging relation with the thread of the driving-screw, but which does not serve to communicate any power from the driving-screw to the carriage.

SPINNING WASTE SILK.

BY HENRI SILBERMANN.

The waste made in combing and spinning florette silk is called Stumba and forms the raw material for bourette yarn, the manufacture of which has developed during the last half century into a very important industry. Bourette yarn is made either by the worsted or the carded woolen process and requires a large number of different machines such as beaters, cards, doubling, combing and drawing machines, gill boxes with porcupine rolls or fallers, ring spinning frames and mules. These machines are used without alteration for the manufacture of bourette yarn.

The quality of Stumba varies with the florette stock from which it is obtained. The bourette fibres are not more than 1 1/2 or 2 inches long. They are mixed in a tangled mass which contains much foreign material and hard nibs. In consequence of this condition the material must be subjected to very energetic action in working it into yarn. In place of the filling machine a card is used.

Cleaning the bourette stock is a very important work and accompanied by a considerable loss of weight. The series of operations is similar to those of woolen spinning. The stock is first run through a beater and picker for the purpose of removing impuri-

ties which consist of particles of the silk worm, dust, etc. The stock is spread on a feed apron which delivers it to a pair of feed rolls, which hold it firmly while it is thoroughly opened up by the arms of a rapidly

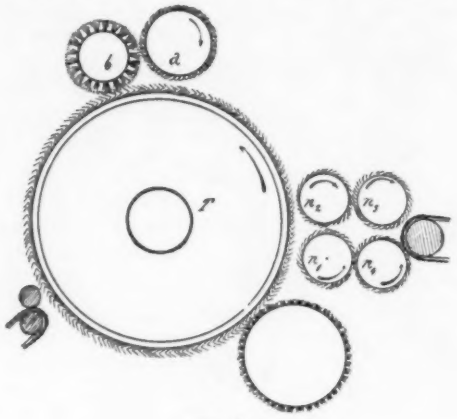


FIG. 65.

revolving cylinder called a beater. As the stock is released by the revolving feed rolls it is carried around by the cylinder and delivered at the other side of the machine. The dirt and other foreign material separated from the stock falls through a screen below the machine. The light dust is carried off by a fan. The stock is now passed through a breaker which consists, as shown at Fig. 65, of a cylinder covered with card clothing working against similar rolls covered in the same way. The stock is delivered in the form of a fleece. The cylinder, which is about 40 inches in diameter, revolves 100 turns per minute. The production is about 300 pounds per day of 10 hours.

The next processes are carding and combing. The bourette card shown at Fig. 66 is

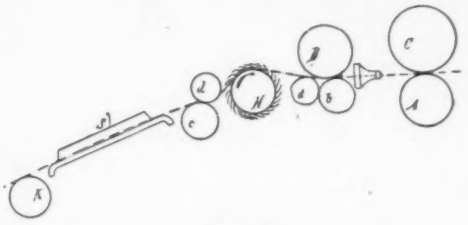


FIG. 67.

similar to the ordinary wool card. The process preparatory to combing bourette stock consists of drawing in combination with combing on porcupine rolls. The stock from the card is drawn and doubled two or three times and in this way a very uniform sliver is obtained from the comb. Fig. 67 shows a section of a bourette drawing frame in which the front rolls, A b, are driven at the same

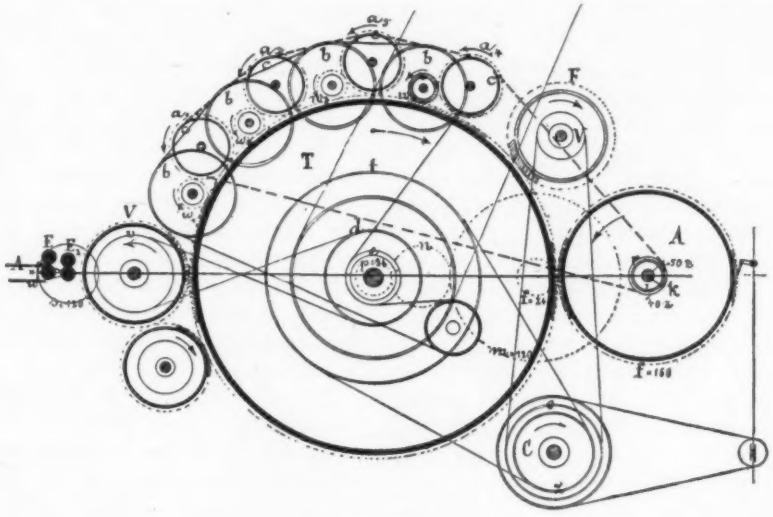


FIG. 66.

surface speed; H is a porcupine roll; K, a wooden carrier roll; c d, drawing rolls; A, the drawing-off roll; B is a press roll covered with leather or rubber. If the stock is short leather makes a better covering than rubber.

S ' a carrier table. A and C are held together by strong pressure.

Four card slivers are delivered to the first drawing frame; three of the slivers from the first drawing frame are delivered to the second frame. The first frame has a draft from 3 to 5; the second frame from 3 to 4. Five slivers from the second frame are delivered to the third drawing frame. In the last frame the needles of the porcupine rolls are finer and more closely set, otherwise the frame is the same as the previous ones. The carded sliver is thus doubled from eight to ten times and formed into a fleece or band about 8 inches wide. Fig. 68 is the winding apparatus. The fleece from the third drawing frame passes over rolls set in the table, T; through the press rolls, E E, from which the compact fleece is wound on a roll resting on the rolls, c c'. In this form it is ready for the combing machine, Fig. 69, which straightens the fibres and separates the long from the short stock. The more uniform the length of the fibres in the long combed stock, the smoother and more uniform will be the yarn.

The Lister and Heilmann combs are almost exclusively used for combing bourette silk. In the Heilmann machine, Fig. 69, S is a full spool of the stock to be combed; l, the guide plate; c c', nippers; k, sector; v, upper comb. The sector and the upper comb comb the silk fibres, laying them parallel with each other. The long stock is drawn from the machine by the rolls, a b. The noil is stripped by the brush, B, from the sector and delivered to the card roll, A, from which it is stripped in the form of a sheet or band. There are four heads on each machine. The stripping rolls deliver the long stock in the form of a thin fleece, which is condensed by revolving tubes and delivered into cans. The production varies from 10 to 15 pounds per day, from 30 to 40 per cent. of which is long stock. From 10 to 12 slivers from the comber are delivered to the spreader which converts it into a fleece of a certain weight. This is in turn drawn finer on the set-frame and again put into the form of a band or fleece which passes through five or six drawing and doubling frames. On the last one is a condenser which imparts false twist to the strand. This is next run through a spindle drawing frame which converts it into roving.

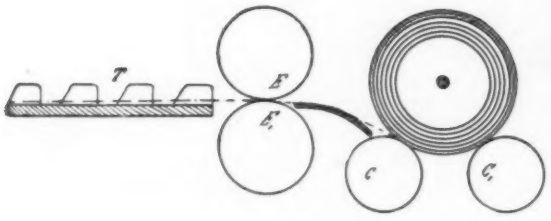


FIG. 68.

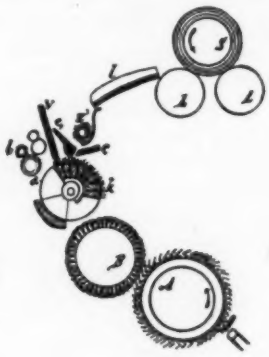


FIG. 69.

The spreaders consist of a pair of front and back rolls with a porcupine roll and a series of fallers in addition. When a certain weight or length of the fleece is wound on the spool the machine is automatically stopped. The set-frame has a double system of fallers. The first drawing frames have from two to three porcupine rolls; the last, only one. Usually four drawing frames are included in one set of machines.

The next machine is the condenser, Fig. 70, in which C is a porcupine roll; a b, the front rolls; k i, the condenser aprons; n m, the winding rolls; e g f, the delivery rolls. The object of this machine is to reduce the fleeces of the last drawing frame in size and condense it so that it can be wound on the spools. The condensing is accomplished by pressure and vibration of the leather aprons, i k, which at the same time move forward and deliver the condensed roving to the spool, m.

This rubbing of the stock has a tendency to cross the fibres and thus reduce the lustre of the roving. Owing to this effect the apron condenser is not used for fine yarn, and only on the last drawing frame for coarse yarn. A rotary tube is to be preferred to the apron

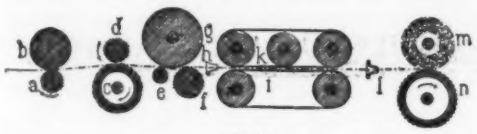


FIG. 70.

condenser. The resulting roving is then delivered to the bourette flyer, Fig. 71.

The following general remarks may be made regarding these preparatory machines for bourette spinning. The length and size of the needles are reduced, gradually, the needles growing shorter and finer and set closer as the process advances. A careful adjustment of the needles is an important factor in the process. The process of manufacturing bourette yarn is much simpler than that for florette yarn as in the former case there is ordinarily but one quality of raw material. Formerly florette yarn was spun on the mule, but during late years the ring frame has been extensively used so that at present only the very soft twisted yarn to be used single is spun on the mule. All other bourette yarn for ply yarn is spun and twisted on the ring frame. The ring frame has the advantage of making a round, uniform and elastic thread. The ring frame gives very good results for spinning and twisting bourette yarn because the space between the delivery rolls and the spindle points can be made very short.

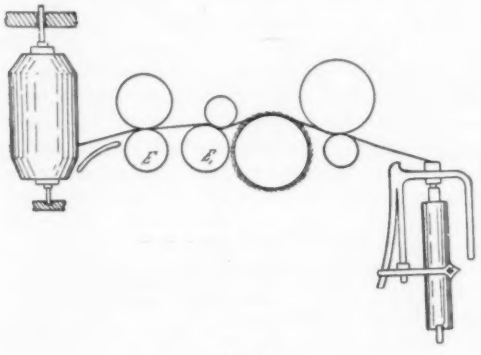


FIG. 71.

The speed of the spindles on coarse yarn is about 2,000 turns per minute; on fine yarn from 3,000 to 6,000 turns per minute. Single florette yarn is twisted open band while the ply yarn is twisted cross band. The reverse is the case with bourette silk, the single yarn being twisted cross band and the ply yarn open band. The draft in spinning bourette varies from 6 to 12.

Spanish Cotton Industry.

The shortage of cotton has affected every country in the world and the cotton mills of Spain as well as those of the rest of Europe have been forced to curtail production. This has resulted in throwing many workmen out of employment and causing much suffering in the cotton districts. The cause of the crisis is well understood and efforts have been made to induce the Spanish government to encourage the cultivation of cotton in Andalusia and in the Spanish possessions of North Africa. The Spanish Minister of Finance has been ordered to draft a bill, of which the following are the chief features: 1, The remission of the tax on land used for the cultivation of cotton. This remission to continue for three years and after that time only a portion of the tax is to be restored. 2. An appropriation of $75,000 will be paid as premiums to cultivators of cotton. The Catalonian manufacturers have petitioned for a reduction of the import tax on foreign cotton.

Narrow Fabric Loom. E. B. Hamel & Son, Tamworth, England, are placing on the market an improved narrow fabric loom. Each piece of tape or ribbon has its own machine and is woven entirely separate from the others, there being nothing in common except the shafting in the mill. It is claimed that this individual system of weaving narrow fabric possesses many advantages over the multiple system. The single loom is proportionately lighter and can be run much faster. The Hamel loom runs 360 picks per minute and it is said that one girl can tend 200 machines.

Questions and Answers.

Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD RECORD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

For reply to questions that are not of general interest to readers of textile journals, such as those relating to the composition of yarns, analysis of fabrics, etc., we will charge the enquirer with the cost of the investigation.

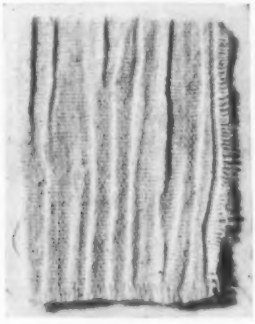
Finishing Cotton Crepon.

Editor Textile World Record:

How is the enclosed sample of crinkle cloth or crepon finished? How should the goods be woven to give the crinkly effect when finished.

Stone Court (436.)

The crinkle or crepon effect in the sample referred to and shown in the accompanying illustration, is caused by the contraction of the filling after the cloth is woven. This contraction results from the extra twist in the filling and due allowance must be made for this shrinkage when laying



the cloth in the loom. In making the goods an ordinary warp may be used; the weave is plain. For the filling, the square root of the yarn count multiplied by 7.25 will give about the right number of turns of twist per inch. That is, for a 20's filling the turns per inch would be about 32. Filling with this amount of twist cannot be used as it comes from the frame because it would kink badly. It should be kept in a damp place two weeks or more to age it, and even then there must be a heavy tension in the shuttle in order to avoid kinks in the cloth. The cloth when wet will shrink greatly and the amount of "puff" or "blister" on the finished goods will be in the same proportion to plain cloth as the loom width is to the finished width of the goods. I should say the goods from which the sample was taken were finished about two-thirds of the loom width.

Cayuga.

Dyeing Denims.

Editor Textile World Record:

What is the advantage of an indigo dye in the denims of the present make? Is the indigo more expensive than the best aniline dye?

Blue Denim (438.)

At the present time denims are manufactured quite extensively in other colors besides blue, but principally in blue, black and brown. Blue denims have always been most in demand and were formerly dyed almost exclusively with indigo on account of its known properties of fastness and light. In recent years, however, other dyestuffs have been introduced which satisfy special requirements, including fastness to washing. These are the diazotized developed blues, which are as good as indigo, and the sulphur blues, which are a strong competitor for first place as a blue dye for denims.

The manufacturers of these goods state that it is impossible to market them unless they possess the peculiar odor of natural indigo, though even this feature is being produced to some extent by artificial means.

The difference of cost of dyeing with sulphur blue as compared with indigo is about 40 per cent. in favor of the sulphur blue.

Palmetto.

Loop Yarn.

Editor Textile World Record:

Is there any book published on the manufacture of fancy yarn such as boucle or loop yarn?

Monongahela (428.)

We do not know of any book treating of the manufacture of fancy yarn. Very little is to be found bearing on this subject in any technical work. Two articles on the manufacture of fancy yarn have recently appeared in this journal; one in January, 1903, and the other in April, 1904. Manufacturers of boucle yarn have jealously guarded from the public view the special twisting devices for this yarn

Setting Twist in Silk Yarn.

Editor Textile World Record:

What is the best method of setting twist in hard twisted silk yarn? I find the steaming process long and tedious and would like to know of a substitute.

Cocoon (429.)

An experienced silk worker to whom this question was referred replies as follows: "In Paterson the setting of the twist in silk yarn by the steaming process is not considered a long and tedious

method if properly applied. The doubling, twisting and winding is done at one operation on one machine, on to an iron headed spool with a spindle hole running entirely through. Transverse holes through the barrel of the spool allow the steam to penetrate the silk when the spools are placed in the steaming box. If the yarn after doubling and twisting is wound on wooden spools and then rewound to iron head spools the operation is lengthened considerably. The steaming process is preferred here to gassing."

Non-Crocking Velvet.

Editor Textile World Record:

How can we prevent the crocking of silk velvet? The goods, which are used for coat collars, come clean from the loom, but crock badly after shearing in spite of a thorough brushing and careful cleaning with benzine. Weston (420.)

The non-crocking quality of silk velvets depends mainly upon the method of dying, and if dyed improperly, after treatment is but a partial remedy for the difficulty.

Bleaching Cotton Knit Goods in the Piece.

Editor Textile World Record:

Kindly inform us about what equipment is necessary for bleaching cotton knit goods in the piece? About what would be required to handle 1,000 lbs. per day, and what would be the cost of chemicals? Kier (417.)

This output could be handled with a wooden kier, about 6 by 7, with a vomit pipe, a bleaching kettle and a good extractor. The cost of chemicals should not exceed one-half cent per pound. We know of a small bleachery in Pennsylvania where the goods are simply boiled out in a kier, then steeped in an open tank, in which is chloride of lime, and soured and washed in a wash machine. If the product was large enough, we see no reason why it could not be done in a regular garment dyeing machine of Klauder-Weldon type, providing the cylinder was built of bronze and tub was copper-lined, although we do not recall an instance where such machines are employed.

A more elaborate plant could be fitted up, which is estimated by a builder of such machinery to cost about $1,000, and which would consist of a 42" extractor, with copper basket, a cedar kier 6 by 7, bleach vat 3 by 4 by 8, acid-proof vat the same size, a stretching and finishing machine, poles, etc. This would also include an allowance of about $200 for the piping, transmission machinery, etc., but if there was no power would have to figure on the cost of a small boiler and engine besides.

Mercerized Cotton Yarn.

Editor Textile World Record:

Does mercerized yarn deteriorate in strength in the course of time? Artery (435.)

The matter of the strength of mercerized yarn depends entirely upon the treatment it has received. If the yarn has been properly treated there is no doubt that it gains in strength and attains even a considerably higher degree of strength after a period of six months or thereabouts, than immediately after being processed; the lustre also is improved by time. Very often, however, yarns are badly handled and then quite the contrary is the case. After the period of a few months the stock will be found to have lost even its normal strength and the lustre is dulled and disappears. Mercerized yarns should be stored on a cool, dry ground floor.

Dyeing Aniline Black.

Editor Textile World Record:

Where can I get a book treating of the aniline process of dyeing hosiery? Eye Glass (437.)

We believe that no book has been published treating of the aniline process of dyeing cotton hosiery. Noelting, "Anilinschwarz," recently published in German, treats of the general subject of dyeing aniline black.

Pin Tube Attachment.

Editor Textile World Record:

In the May issue of the Textile World Record on page 140, you have a cut of a child's waist showing a patent pin tube attachment with which to fasten children's garters. Will you kindly advise us where we can get this pin tube? Hudson (433.)

The inventor and manufacturer of the pin tube referred to is W. S. Hunkins, care Wyman, Partridge & Co., Minneapolis, Minn.

Books on Bleaching.

Editor Textile World Record:

What is the best book on the bleaching of piece goods? Please tell where it can be purchased and the price. Morgan (439.)

We can recommend any of the following works: Theis, Die Breitbleiche der baumwollener Gewebe, $2.50, German. Theis, Ueber Breitbleiche, pamphlet, 50 cents, German. Tailfer, Bleaching of Linen and Cotton, $7.50, English translation from the French. Hoelbling, Fabrication des Matieres de Blanchiment, $3, French, also in German.

KNITTING DEPARTMENT.

For Knitting Mill Machinery, Equipment and Supplies, see pages 232 to 253. Also Buyers' Index.

KNIT GOODS SITUATION.

The all-important matter in the knit underwear business today is the placing of spring lines for 1905. Nearly every manufacturer and agent is out soliciting business, and although it cannot be said that a great volume of business has been placed, yet most sellers state that they have booked a fair amount of business, and the indications are that a great many buyers will be in the market about the middle of July, which is somewhat earlier than their accustomed time.

Practically all lines are being shown at last year's prices, and in some few instances we learn of lower quotations being made. This week our attention was called to a low priced men's balbriggan that the Gilbert Knitting Co., of Little Falls, N. Y., are reported to have taken some large orders on, weighing about 5 1/4 lbs., the drawers being made with double seats, outside band and suspender tapes, at $2.00 per dozen.

There are many lines of men's ribbed goods being shown in the neighborhood of $3.50, in blue, brown, salmon, Egyptian and champagne shades, and during the past week we have heard that several manufacturers have shaved their prices somewhat on this line, in some cases putting in the drawers at $3.40, and in others giving a 2 1/2 per cent. trade discount.

The Diana Knitting Co. are showing a very creditable line in ecru, blue, salmon and brown, at $3.25, and black at $3.35; the shirts being made with a silk band front, the drawers with extension strap backs and double seats.

In ladies' straight ribbed goods there is not much particularly new. The Amazon Knitting Co. are showing a very similar line to that of last season at practically the same prices; they have also added a line of ladies' combination suits at from $1.95 to $4.00, and a line of ladies' ribbed pants at from $1.45 up to $3.50, and we are informed they have been taken very liberally by the eastern buyers.

Julius Hirsh, of Philadelphia, is showing some new ideas in the matter of trimmings for ladies' ribbed vests, and we illustrate at Fig. 1 an imitation of a hand-crocheted trimmed vest that can be retailed at 25c. This class of trimming has become very popular during the past season in better goods, and this particular garment will no doubt find a large sale.

FIG. 1.

Fig. 2 is a Richelieu ribbed mercerized garment with a birdseye stitch on the sides, which makes a very sightly 50c. vest.

Fig. 3 shows a new feature in the making of ladies' lace trimmed umbrella pants. This is done by changing from the tuck to the fine stitch for a distance of about 2 inches around

the leg, which has the effect of giving a greater flare to the lace bottom. We are told that some liberal orders have been placed on this line.

West Bros., of Syracuse, are showing,

FIG. 2.

through their New York representatives, a very handsome line of men's plain colored mercerized goods at $7.50, in a wide range of desirable colors, and this class of goods is in good demand by the gents' furnishing trade.

There is little interest shown in heavy weight underwear at the present writing, and until the jobber makes his deliveries to the retailer little duplicate business is looked for.

From all reports taken, a large advance business has now been placed, and the conditions do not warrant much addition thereto until the season opens and some inroads made into the present purchases.

A persistent rumor has it that certain standard fleeced goods are offered at prices slightly under the market, and while this cannot be confirmed by the parties interested, yet it is quite possible that such is the case.

Raw materials can be bought at lower levels than those on which some prices have been based, and if these manufacturers are not loaded on high priced materials, they can make attractive prices on today's market.

HOSIERY.

The retail hosiery selling season is now in full swing, and dealers are all very busy. Duplicate orders are coming in in large volumes, and tans are more plentiful, although prices are still high. The fact that the demand for tan hose has been so good recently has had the effect of cutting into the sale of blacks, and consequently jobbers' stocks of the latter are heavy. Whites in both ladies' and children's goods are in good demand.

Nearly all lines for 1905 are now being shown at as low prices and in some cases lower than for 1904. Orders for tans are being placed very fairly in all grades. Plain gauzes are not taken as much as last year, and whenever orders are placed on them it is with the understanding that there should be no spliced selvage nor high spliced heels,

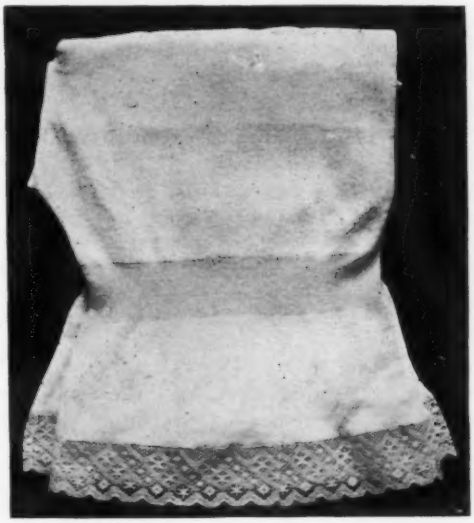


FIG. 3.

owing to the fact that these reinforcements show when worn with oxford ties.

Laces promise to be good for 1905, and in the better grades are taken with garter tops.

A low grade split foot hose has made its appearance on the market this season at

about $1.05, and while the quality is not good, the manufacturer reports a very large business booked thus far.

The seamless lace hose is being selected more than the fashioned goods, for the reason that it is possible to make a seamless stocking with the lace pattern running to the toe, which is not possible with the fashioned goods.

KNIT GOODS.

Knit blouses will play a considerable part in fall purchases. It is difficult to say whether the demand comes from the natural course of events in the cycle of fashion or whether from a development of styles—at any rate, manufacturers are showing samples that will probably make the knit blouses a more popular and useful garment.

The sailor collar is being relegated to the past, and now the demand is principally for low neck V shaped models, with some call for small collars. White takes the lead, with red a second choice, and in the finer grades oxford. One very attractive design has a full bishop sleeve, V neck, and made of zephyr with a triple zigzag effect down the front, and four large pearl buttons.

ESTIMATING THE COST OF HOSIERY.

REPORT OF A SPECIAL COMMITTEE OF THE SOUTHERN HOSIERY MANUFACTURERS' ASSOCIATION ON COST ACCOUNTING.

This committee, composed of John M. Jones, Jr., J. H. McPhail and Harold Lamb, reported as follows:

At the Chattanooga meeting a discussion on cost accounting developed the fact that hardly any two of the manufacturers present figured costs alike, or agreed as to what constituted total cost. All agreed, however, that the question was one of vital importance, and a resolution was offered authorizing the president to appoint a committee to take the question under consideration and report a uniform cost accounting system to the next meeting.

In approaching the question, your committee recognizes the fact that it would be almost impossible to adopt any hard and fast rule of accounting that would fit every manufacturer. Therefore we deem it wise to offer only an outline or skeleton and leave it to each manufacturer to modify or enlarge upon it to fit his particular case, if he has not already a better system of his own.

Improved method in cost accounting is a question that is engaging the attention of our brightest and most progressive manufacturers in all lines. So necessary is it to the proper management and conduct of our great and growing industrial enterprises, that obedient to the law of necessity, men have arisen, who may be called for want of a better name, business doctors, B. D., men who are elevating the science of cost accounting to a profession.

Systems of cost finding in manufacture are necessarily creations of evolution. Inexperienced in manufacturing as many of our people are, it is not surprising that there exists so wide a difference in prices of similar products, resulting mainly from the different systems of figuring costs, or rather to different ideas as to what constitutes total costs.

The steadily declining profits in the manufacturing of staple articles gives just cause for serious apprehension, and it behooves every manufacturer to watch closely and cover every item of necessary expense in his cost estimates.

In any cost accounting system, the first essential is an accurate classification of the various expense and material accounts.

Manufacturing accounts should be classed under four general heads.

1st. Accounts of materials or raw stock entering into the articles manufactured.

2d. Labor accounts classed as productive and non-productive by some, and by others, by time and piece labor.

3d. Various accounts, classed by many under the head of general expense accounts.

4th. Selling expense. As the selling expense has nothing to do with the question covered by the resolution, we will pass to the consideration of the other three classes of accounts, viz., materials, labor, and general expense. Nor will we take up your time discussing the question of material and labor accounts, as we believe there is no difference of opinion as to whether these items should be figured into the cost of articles, we will

simply classify labor under its different forms of time and piece, further on.

Under the head of general expense accounts, many manufacturers differ as to how far these accounts should be figured into the cost of articles manufactured; some maintain that every item of expenditure, from office to night watchman, should be figured into factory cost; others, who have been equally successful, claim that office expense, salaries or interest, except on borrowed capital and depreciation, should not be figured into the cost, but provided for in the profit placed on the goods to be sold. We believe this idea of what constitutes cost is fallacious and misleading, and is responsible in a great measure for wide difference in selling prices of identical articles made by different manufacturers. Your committee believes that if all manufacturers followed the same general system of figuring cost, the difference in selling prices would be very materially narrowed, and selling prices elevated to a point commensurate with the true cost.

With every idea of expenditure figured in, you have a dead line below which no manufacturer should permit the selling department to cut, a point which with selling expense added, would provide legitimate dividends for the investor and a fund for the renewal of antidated or worn out plant and machinery.

As a guide to a step in this direction we would suggest that the following accounts be kept, which may be condensed or enlarged to suit the conditions of each manufacturer.

EXPENSE AND OTHER ACCOUNTS.

1st. Yarn accounts.
2d. Dyestuff accounts.
3d. Paper box accounts.
4th. Case accounts.
5th. Needles accounts.
6th. Freight and cartage accounts.
7th. Mill supplies accounts.
8th. Fuel accounts.
9th. Time labor accounts.
10th. Piece labor accounts.
11th. Factory repairs accounts.
12th. Machine repairs accounts.
13th. Taxes and insurance accounts.
14th. Interest and discount accounts.
15th. Office expenses.
16th. Traveling expenses.
17th. Salaries accounts.
18th. Bad debts and law account.
19th. Depreciation.

In addition to the above operation accounts, we would recommend that the following statistical accounts be kept.

Waste, seconds, dozens and pounds of goods produced. Dozens and pounds of goods shipped and cost of same. Cost of which should be charged to sales department. These accounts should be kept in tabulated form in pounds, dozens, dollars and percentages, and should be footed, extended and balanced weekly, monthly and yearly. This would give valuable data for periodical comparisons and enable the manufacturer to keep his business well in hand.

The first and most important of the operating accounts is the yarn account, which should be charged to the knitting department at cost, if the manufacturer purchases his yarn and at the market price if he makes it.

If a manufacturer makes his own yarn in the same building or under the same management, the yarn department should be charged with its proper proportion of office expense, salaries, power, interest and depreciation or any other expense proratable between the two departments. Yarn account should be charged with cartage on same and credited with cases and cases charged to case account.

Dyestuffs should be charged with freight and cartage paid on same. Freight and cartage account proper should represent only freight and cartage and express on samples and bands.

This amount at the end of the year divided by the net pounds of goods produced and shipped will give the exact cost per pound for freight and cartage. The needle account may be charged with all needles, sinkers, loops and transfer points.

MILL SUPPLIES.

Under this head may be charged all bands, labels, lining paper, nails, brooms, stamps, stamping inks, lace, leather, belt hooks, belting, etc., and many other items too numerous to classify under special accounts.

Interest account should be charged with at

least six per cent. on all capital, whether invested or borrowed.

DEPRECIATION OF BUILDING AND MACHINERY.

An average of ten per cent. should be charged to surplus account to cover depreciation on plant. If buildings are rented, a rent account should be carried, instead of depreciation on building.

Operating account should be classed under two heads, fixed and variable.

FIXED ACCOUNTS.

Are those that do not vary greatly with increased or lessened production, and are as follows: Fuel, repairs, taxes, insurance, office and traveling expenses, salaries, time, labor, interest and depreciation.

VARIABLE ACCOUNTS.

Are those that increase or decrease in ratio to production and are: Yarn, dye, boxes, cases, freight, mill supplies and piece labor.

At the end of the year, fixed accounts and the total production in pounds or dozens should be divided by 300, which will give the daily average for a work year. The daily average expense divided by the daily average production in pounds or dozens, will give the actual cost for fixed expenses. To this, add the variable cost items, beginning with yarn at cost, plus per cent., to cover waste and seconds; dye, boxes, cases, needles, mill supplies, freight and piece labor. Yearly waste, dye, needles, mill supplies and freight accounts should be divided by yearly production of pounds or dozens, which will give actual cost for these items.

The foregoing suggestions give only a brief and imperfect outline of a cost accounting system. The subject could be enlarged and elaborated to an almost unlimited extent, and thereby made to fit the largest or smallest enterprise. The detail of a cost accounting system is a subject more suited to the talents of a constructive accountant than the committee appointed to consider this important subject.

India, Turkey, and Persia have been celebrated for the richness of their carpets from the earliest times. Even in the Middle Ages they were only used as a luxury by the rich.

A MODERN UNDERWEAR KNITTING MILL.

BY W. H. BRAYTON.

I will select for illustrating this subject a mill with a capacity of 250 dozen finished garments per day, men's ribbed underwear, manufactured from purchased yarn. The ground plan of the buildings is shown at Fig. 1. The arrangement is as follows: F, office; J, main mill; K, dyehouse; L, bleach house; M, warehouse; N, fire proof beltway; O,

W. H. BRAYTON.

toilet rooms; P, elevator shaft; Q, engine and boiler; T, track scale; U, covered coal bin; V, railroad; Y, fire escape.

The office building is a two-story structure, 25 by 40 feet. The first floor has two well-ventilated, light rooms, the front one devoted to the use of the officials of the company, the rear one to the bookkeeping department. The second story is also divided into two rooms.

The boiler and engine building, Fig. 2, is a one-story structure, 40 by 40 feet, one-half only, however, appearing above the surface of the mill yard, the remainder being under

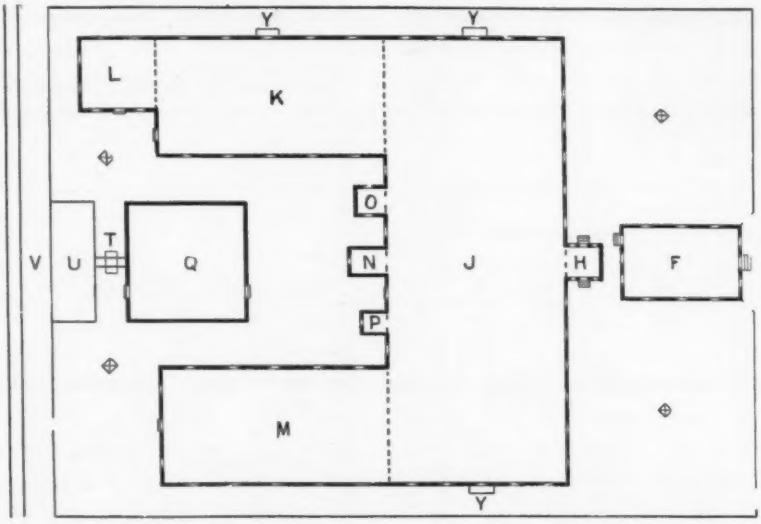


FIG. 1.

ground. The interior is divided by a heavy brick wall separating the engine from the boiler room. The engine room is about ten feet below the ground level and is reached by

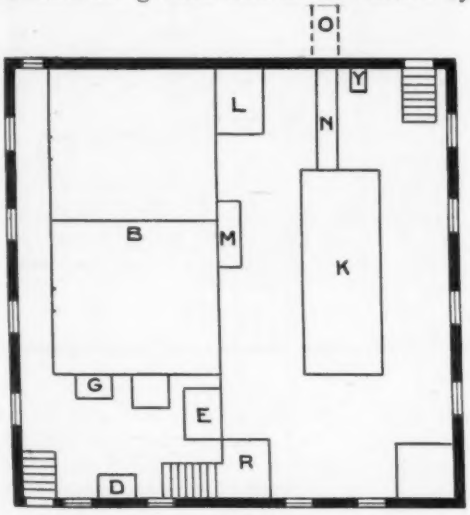


FIG. 2.

a flight of iron stairs. The boiler room, 10 feet below the engine room, is also reached by stairs. In the engine room is a 150 H. P. modern engine, a 500-light 16-candle power dynamo with switch board and indicators, a locker for boiler and engine room tools, toilet and wash room. There are two 100 H. P. modern boilers. The exhaust steam is used for heating the mill.

B, two 100 H. P. boilers; D, coal shute and bin; E, water heater for boilers; G, water pump; K, engine; L, dynamo; R, toilet and wash room; S, stairway leading from mill yard; Y, doorway leading to underground beltway.

An enclosed shaft well contains all the main driving pulleys of the mill. This feature is in line with modern ideas as to economy of fuel and power, and dispenses with the driving of hundreds of pounds of iron pulleys, when a light wooden split pulley will perform the same service. Each story of the main building receives its power from shafts and pulleys in the shaft well, systematically arranged. For the purpose of oiling the shafting there are platforms for each line of shafting, reached by an iron ladder.

The machine and carpenter shop is located in the basement of the main building, Fig. 3. The waste from the different departments is brought to this floor and baled for storage. The main driving belt for this room runs on a pair of tight and loose pulleys and can be shifted from one to the other as desired. This

avoids the necessity of stopping the whole mill when it is desired to shut down the machinery in this room. The driving belt for each of the other rooms is arranged in the same way. The floor space is divided as follows: A, machine shop; B, carpenter shop; C, baling press; D, dust bin from fleecing machine; E, waste bins; G, entrance to elevator; H, driving belt from shaft well; I, driving pulley for basement shafting; J, driving pulley to machine shop line shafting; L, entrance to dye house; N, main line shafting; O, belt to machine shop line shafting.

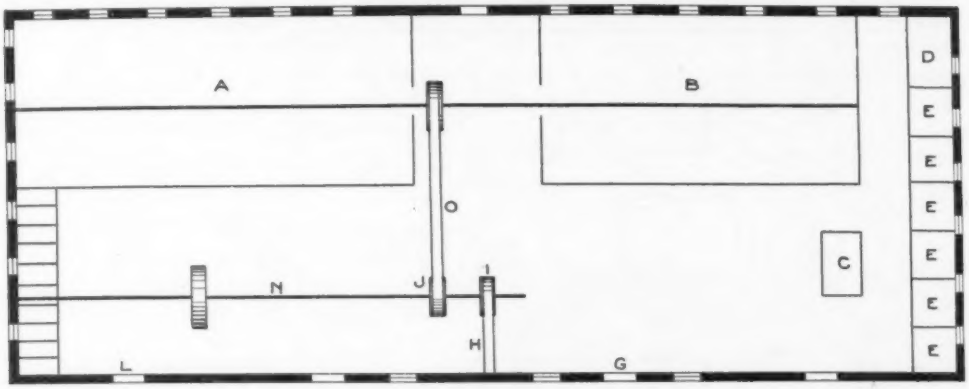


FIG. 3.

The stairways connecting the floors are located in one tower, and at the extreme top of the tower, which is one story above the roof of the main building, is a 10,000-gallon water tank for supplying an automatic fire sprinkler system.

The first floor, Fig. 4, of the mill is the folding department, with a floor space 150 by 60 feet, containing bins to receive work thrown down through a shute from the finishing room above, tables for operators to make up work in press boards for pressing, folding tables for folding garments ready for boxing, tables upon which to box garments, with ample space for piling up full boxes containing goods ready for removal to the warehouse, a sample room for the storage of samples of all lines, dressing rooms and lockers for the help in this department. The arrangement is as follows: B, sample room; C, tables for boxing goods; D, steam press; E, table for making up packages of goods for pressing; F, table for folding goods from press; G, bins to receive goods thrown down from the finishing room; H, bins for holding

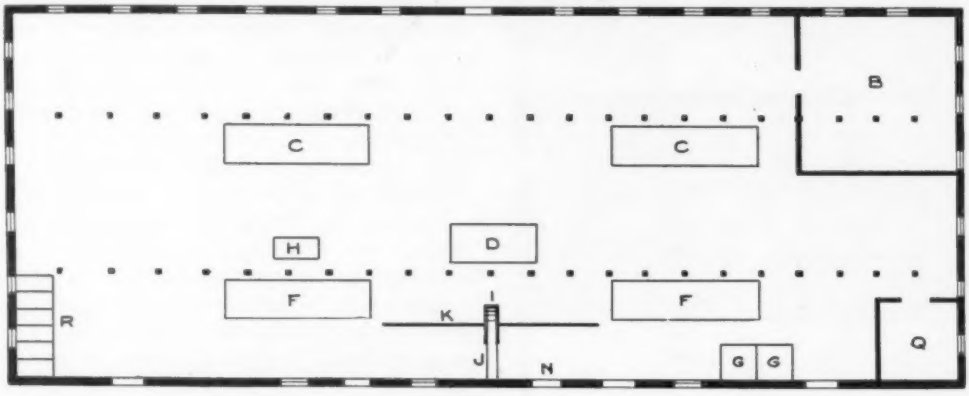


FIG. 4.

press boards; I, pulley receiving belt from shaft well; J, belt from shaft well; K, shaft; Q, dressing room; R, lockers.

The dyeing department, Fig. 5, has a floor space of 75 by 40 feet. There is an elevator for the use of the dyeing, drying and box

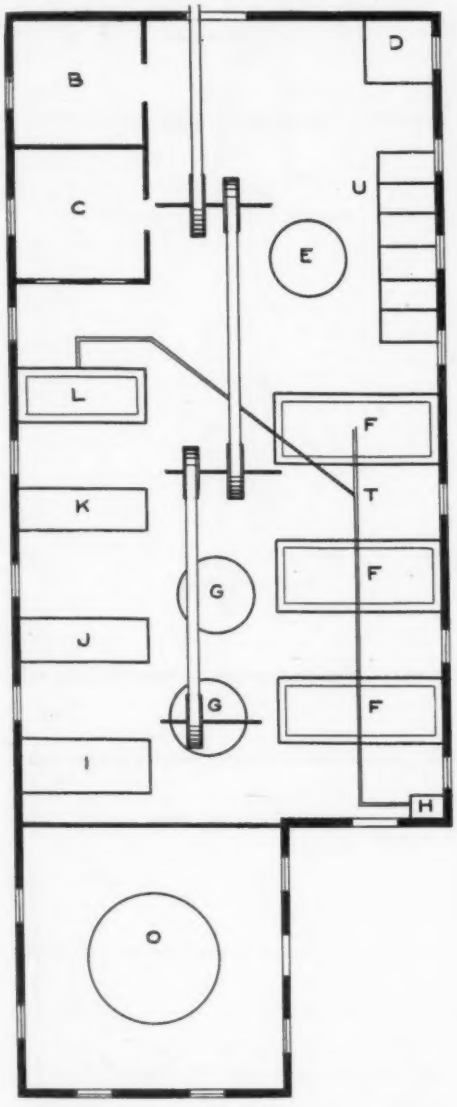


FIG. 5.

manufacturing departments, also a room for the storage of chemicals and dyeing materials. Adjoining this room is the office of the head dyer and the laboratory. The department is arranged as follows: B, supply room; C, dyers' office and laboratory; D, elevators; E, hydro-extractors; F, open dyeing machines; G, cloth boiling out kiers; H, chimney carrying off steam from dyeing machines; I, bleaching kier; J, scouring kier; K, rinsing kier; L, dyeing machine for sample work; O, bleach solution kier; U, lockers.

All the kiers requiring power are driven by friction sprocket pulleys connected by link chains to sprocket pulleys on the shaft. Over

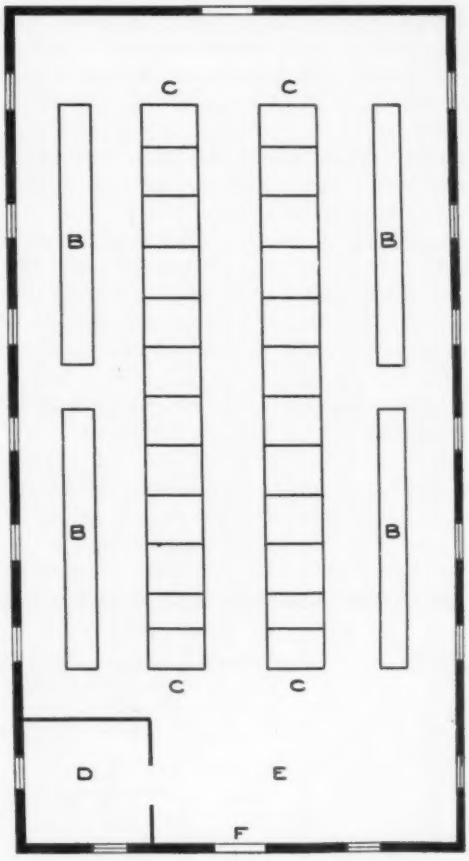


FIG. 6.

the kiers and a few feet above the reel on which the cloth revolves during the dyeing process are galvanized iron hoods conveying steam vapor through pipes to the draught chimney, which has an exhaust fan at the top, thus aiding in keeping the room free from steam.

The floor of the room is laid with two-inch plank about one-half inch apart to allow the drainage water from wet cloth standing in trucks ready for extracting to pass below the false flooring. There is a cemented floor beneath the wooden one, extending the full size of the room, with a slight incline from all sides towards the centre. All the waste water is carried into a man-hole connected with a pipe, in which is a trap to prevent the fumes of sewer gas from penetrating the mill.

The bleach solution building is 25 by 25 feet, in which a large bleach solution tank, equipped with a vertical shaft with fans attached for mixing purposes, operated from the shaft in the dyehouse; at the bottom is a trap door for removing sediment, and about two feet above the bottom is a copper pipe leading into the bleaching kier in the dyehouse.

A modern coal storage building is directly back of the boiler and engine room. This building is 40 by 15 feet and divided into three compartments in the rear, each sufficiently large to hold a carload of steam coal. In front of these is a movable platform with a small hand car on a narrow gauge track for carrying the coal to the boiler room.

The warehouse, Fig. 6, has an entrance from the mill yard. The dimensions of this building are 75 by 40 feet. On the left of the entrance is the shipping clerk's office; on the right, space for packing goods in cases for

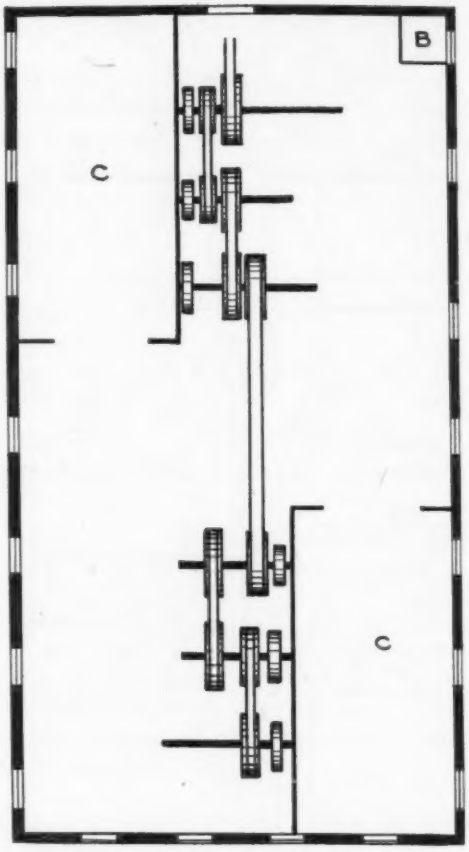


FIG. 7.

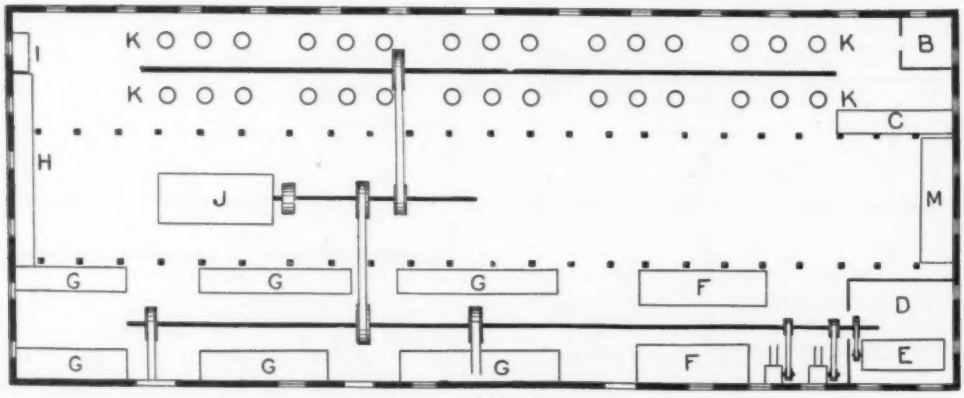


FIG. 8.

final shipment. Back of these are two rows of double bins extending from floor to ceiling and the full length of the room. These bins are for the storage of manufactured goods in boxes awaiting shipment. On either side of these bins are skid platforms

raised about 2 inches from the floor to admit a free circulation of air, and intended for the storage of cased goods awaiting delivery. The arrangement is as follows: B, skid platform, 2 inches from floor; C, bins extending from floor to ceiling; D, shipping clerk's office; E, packing space; F, shipping door.

The second floor is used for the finishing room. The equipment of this department will be treated in a separate article.

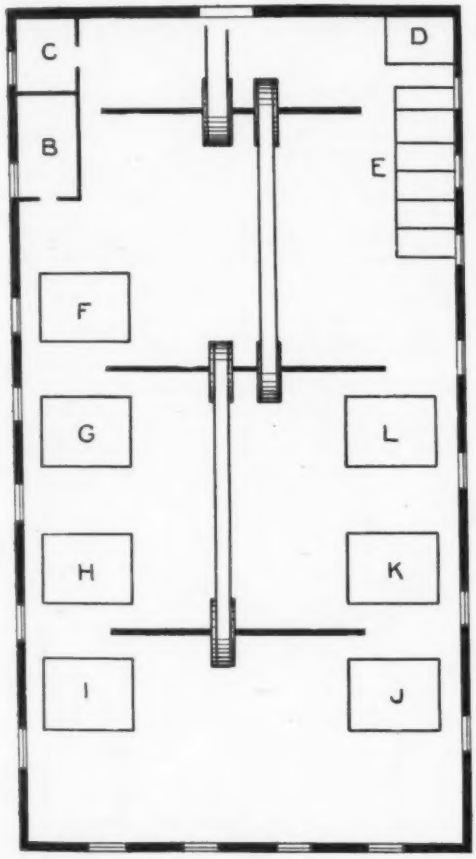


FIG. 9.

The cloth drying department, Fig. 7, is 75 by 40 feet. This room has in addition to the elevator already mentioned, two cyclone drying machines or compartments, each equipped with three circulating current fans, also two large steam coil radiators, sufficient to heat a volume of cold air drawn by fans into the room from ventilators or openings at the bottoms of partitions. The fans are arranged in such a manner that the air heated by the radiators is kept constantly in circulation and at one end of the room is a ventilator with a small fan drawing off the damp air arising from the drying cloth. Each of these drying compartments has large wide doors in order to admit trucks upon which damp cloth is suspended. B, elevator; C, drying rooms.

The knitting room, Fig. 8, on the next floor is 150 by 60 feet. The arrangement of this department is as follows: D, napping room; E, napping machine; F, bins for cloth before or after napping; G, cutting table; H, assembling table; I, shutes to finishing room; J, winding machine; K, double line knitting machines; L, turning machines; M, closet for extra dials or cylinders.

The paper box manufacturing room, Fig. 9, with entrance from the knitting room, is 75 by 40 feet. This department is arranged as follows: C, dressing room; D, elevator; F, scoring machine; G, cover cutting machine; H, slitting and rounding machines; I, box piecing machine; J, covering and staying machine; K, topping machine; L, fly inserting machine.

The capacity of the box machinery is slightly in excess of the actual requirements.

A FABRIC CUTTER FOR KNITTING MACHINES.

The accompanying illustrations show an improved device, recently patented in this country, for cutting knitted cloth into strips before it is wound on the rolls of the cuff knitting machine.

Figs. 1 and 2 are side elevations of the upper portion of the knitting machine, showing the device; Fig. 3, a perspective view of the cutter.

In knitting machines for knitting cuffs the material is knitted in the form of a large tube, and this tube is cut into several strips, each strip being of sufficient width so that when the edges are sewed together a cuff is formed. It is now the practice to cut these tubes into strips after it is taken from the knitting machine. Many of the devices for cutting the goods before they are rolled have failed because stationary knives cannot be used, as it requires a sawing or shearing movement of

the knives to cut the material properly; as the spreader is upon the interior of the tube it is difficult to accomplish this movement.

To the lower ends of the revolving frame which carries the reeling mechanism supports are secured upon each side.

Two rods or shafts are journaled in the

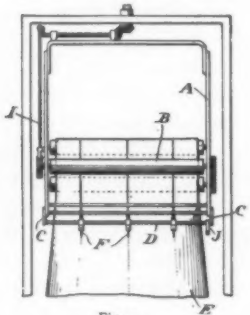


Fig. 1.

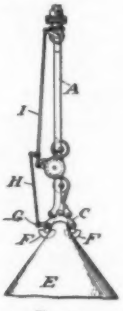


Fig. 2.

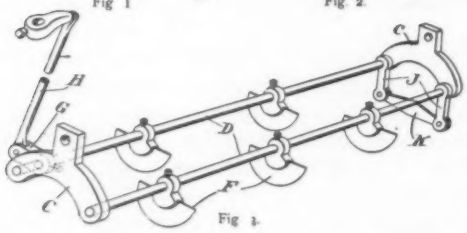


Fig. 3.

supports and the material passes between these rods or shafts, as it travels from the needles to the reeling mechanism.

Semicircular knives are adjustably secured upon the shafts, there being as many knives as it is desired to cut strips from the tube, and these knives are set the required distance apart, so as to cut the proper width strips. The knives upon one of the shafts cut the strips upon one side of the tube, and the knives upon the other shaft cut the strips upon the other side of the tube, as shown in Fig. 2.

Secured to one of the shafts is a crank-arm, to the outer end of which is pivoted a link, which extends up and is connected to a ratchet-rod, which operates the reeling mechanism.

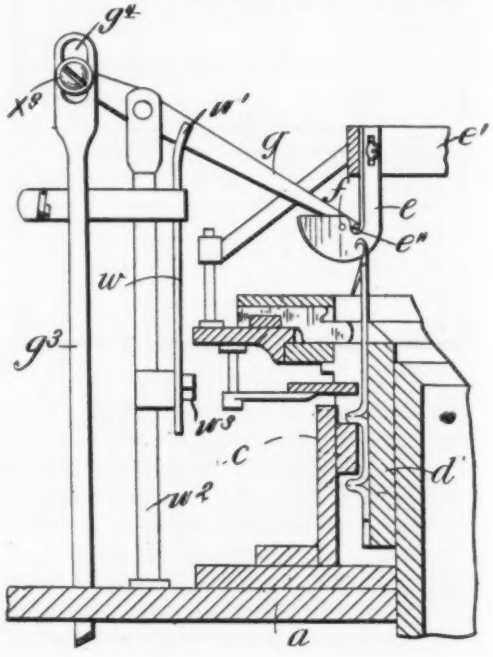
Two arms are secured to the shafts, extending downward therefrom, the lower end of these arms being connected together by a link so that when one of the shafts is rocked the motion will be communicated to the opposite shaft. The knives extend through the material, as shown in Fig. 2, and as the ratchet-rod operates up and down the motion will be communicated to the rod H, thereby rocking the shafts backward and forward and causing the knives to rock or oscillate through the material. Thus the material will be cut by a sawing or shearing movement of the knives.

Suit for Alleged Infringement.

Messrs. Scott & Williams, 2079 E. Cumberland St., Philadelphia, Pa., builders of rib knitting machinery for hosiery and underwear, have issued a statement in which they announce that they have brought suit in United States Circuit Court against Homer P. Snyder Mfg. Co., and its sales manager, William A. Ainsworth, for injunction and damages for alleged infringement of their knitting machine patents No. 368,429, No. 421,147 and No. 681,161, and that they will prosecute the case vigorously. In their advertisement on page 8 they make this announcement, in which manufacturers are "cautioned against the use of infringing machines, and are notified that the purchase and use by them of said machines renders them liable to suit for injunction and damages."

RECENT KNITTING PATENTS.

KNITTING MACHINE. Circular. 762,142. Harry Clarke, Nottingham, England, assignor to Robert Frederick Blair, London, England. This invention relates to circular-knitting machines, and has reference more particularly to machines in which splicing or striping mech-



anism is employed. An important feature of the invention consists in a special switch arrangement for automatically throwing the splicing-gear into and out of action. A further feature provides simple means whereby all the idle floating threads are caused to break after a splicing operation, thus dispensing with cutting devices. Fig. 1 is an enlarged detail view of the splicing-guides, the adjacent parts of the machine being in diametrical section to show the needle-operating mechanism.

KNITTING MACHINE. Circular. 761,385. Emil Langer Neustadt-on-the-Mettau, Austria-Hungary, assignor to Felix Leferer, Vienna, Austria.

KNITTING MACHINE FABRIC CUTTING DEVICE. 762,166. John J. Harcher, Philadelphia, Pa.

KNITTING MACHINE STOP MOTION. 760,998. Gustav A. Landenberger, Philadelphia, Pa.

KNITTING MACHINE TAKE-UP MECHANISM. 762,614. John C. Brewin, Philadelphia, Pa.

KNITTING NEEDLE. 761,831. William Hart, Troy, N. Y., assignor of one-half to Louis W. Groat, New York, N. Y.

KNITTING MILL NEWS.

New Mills.

Delaware, Wilmington. The old Georgetown Hosiery Mills will be occupied by the Delaware Hosiery Co., recently organized. Operations will be started about August 1, with about 200 people. New machinery will be installed.

*Michigan, Grand Rapids. The new stocking company has been incorporated as the Imperial Knitting Company, with capital stock of $50,000. Work has started on installation of the machinery in the Herkimer Building. S. B. Jenks is president of the concern; F. T. Howell, secretary, and P. B. Gavey, treasurer and manager. They will make a stocking with double heel and in reality will give two stockings in one by reversing, for wearing, thus alternating the heels.

*Mississippi, Columbus. Contract for erection of the new knitting mill for the Geo. W. Kavanaugh Manufacturing Co. has been let to Lindawood, Pucket & McLanahan. The building will be 200 by 80 feet, three stories.

Pennsylvania, Philadelphia. Ernest J. Aucott, until recently a member of the firm of Thomas W. Graves & Sons, is about to start out in the knitting business in the mill formerly occupied by Jos. Halford & Sons at 125 Herman St., Germantown, which property he is about to purchase. Mr. Aucott has placed the order for his machinery, which will consist of 45 of the latest improved machines from the American Knitting Machine Co., and will manufacture ladies' hose, the goods to be sold through Hecht & Campe, New York. He has already many orders on hand and expects to have the plant in full operation by July 1st.

Pennsylvania, Philadelphia. The Narragansett Knitting Co., recently organized, has applied for and expects its incorporation papers within a few days. They have taken over the business of the Mascot Hosiery Co., operating 190 machines on seamless half hose and women's plain and fancy hose at Mascher and Turner Streets. M. S. Bryant, with an office at 317 Bourse Building, is one of the interested parties.

Pennsylvania, Philadelphia. Messrs. Hoffman Bros. and L. Effenberg, with a capital of $2,000, have just started up in the manufacture of fine ladies' hosiery under the name of the Girard Hosiery Company at 2420 Waterloo Street. They are running 14 knitters and 1 sewing machine by steam, using 18 and 60 cotton yarn. Harry Hoffman is the superintendent. They have planty of orders on hand and it is their intention to increase the size of the plant as business warrants. The dyeing and finishing is done outside.

Pennsylvania, Reading. The Gem Knitting Mills Company is a new concern which will start a plant here for manufacturing hosiery and knit goods. Milton Z. Geiger, Roland G. Scarlett and Henry K. Harrison are the incorporators.

*Pennsylvania, Scranton. Work has started on building new mill for the Groat Knitting Co., of Greenwich, N. Y. Estimates are now being taken on special machinery.

*Pennsylvania, South Bethlehem. Operations will start about July 10 in the new knitting mill, to be known as the Austin Knitting Mills.

Pennsylvania, Williamsport. The Williamsport Hosiery Company will soon start up operations in the Williamsport Knitting Company's plant. Men's half-hose will be made, plant to have capacity of about seventy-five dozen a day.

*South Carolina, Spartanburg. The Crescent Manufacturing Co. has started work on their new mill, which will be 132 by 62 feet, two stories, with dye house, 62 by 41 feet. This company will manufacture misses' and children's fine gauge hosiery and will start operation with 50 machines.

*South Carolina, Walhalla. The Oconee Knitting Mills are installing machinery in their new mill. This concern will make misses' and children's hosiery, operating 25 knitting machines. A dye house is attached.

Utah, Provo. The Provo Knitting Company has been incorporated with capital stock of $25,000. David L. Van Wagenen is president of the company; Ray Ashworth, secretary, and A. C. Booth, treasurer.

*Utah, Provo. The new knitting mill started recently by the Utah Knitting & Mfg. Co., manufactures a general line of knit underwear. Joseph Broadbent is superintendent of the plant. Goods are sold direct.

Enlargements and Improvements.

Alabama, Athens. The Nashville Hosiery Mills, Nashville, Tenn., has purchased the Limestone Hosiery Company's plant and will remove same to Nashville.

North Carolina, Enfield. Additional machinery is to be installed in the Enfield Knitting Mill, doubling the present capacity.

New Jersey, Haddonfield. The Estaugh Knitting Mills are very busy on orders for their light weight ladies' underwear of cotton and mercerized, selling the goods through Critten, Clift & Co., N. Y. Mr. Wood, the superintendent, states that in a short time they will make an addition in the way of two new ribbers. The plant is run by gas.

*New York, Gloversville. Work has been started on foundations for the Gloversville Knitting Company's new mill.

New York, Elmira. An addition is being built to the Elmira Knitting Mills.

Ohio, Findlay. It is reported that the Superior Underwear Company of Bowling Green contemplates removing the plant for purpose of enlarging same and is favorably impressed with this place.

Ontario, Hamilton. G. B. Perry Knitting Co. is doubling its capacity and is interested in hearing from parties having good secondhand machinery for sale. It makes women's and children's cotton and wool ribbed underwear, and now operates 10 latch needle machines and 10 sewing machines.

Pennsylvania, Philadelphia. The Carvin Knitting Co., Mascher and York Sts., manufacturers of fine fashioned and seamless hosiery, are running their 240 knitters full time, reporting business as fair. This company has just placed an order for 22 Mayo machines and 10 McMichael & Wildman ribbers, which will be put in operation as soon as they are delivered and set up. The daily production of this plant is 400 dozen per day. The goods are sold through New York.

Pennsylvania, Shamokin. W. F. Taubel, manufacturer cotton hosiery, at Riverside, N. J., with branch mills at Shamokin and Tamaqua, will erect an addition, 125 by 65 feet, three stories and basement to each branch plant.

Utah, Logan. The Logan Knitting Factory will increase the capacity of the plant by installation of new machinery. They will make a line of goods not now carried.

*Virginia, Portsmouth. The Lewis Jones Knitting Company of Winchester, has established a branch mill at this place. Plant is equipped with 20 knitting and 20 sewing machines, bleach house, etc. Joseph W. Leafe is in charge of this plant.

Mills Starting Up.

New York, Sherburne. Operations have been resumed in the Canasawacta Knitting Co.'s plant, after shut down for about one month, during which time repairs and additions wer made.

*Pennsylvania, Lock Haven. The Lock Haven Knitting Company has started operations in their new mill, making cotton, wool, worsted, silk and ribbed underwear.

*Pennsylvania, Womelsdorf. Heister & Hirst, which resumed operations in their plant June 15th, now operate 35 knitting machines on men's cotton half hose. Goods are sold direct.

Facts and Gossip.

*Connecticut, Danielson. Francis J. Leavens, of this city, has been appointed trustee of the bankrupt estate of the Uncas Knitting Company.

*Georgia, Tennille. Efforts are being made by local investors to meet terms offered by William McKearn (Philadelphia) and J. E. McLaughlin (Troy) to establish a knitting mill here. It is proposed to organize a company with capital stock of $30,000, half of this amount to be taken locally.

Georgia, Villa Rica. A knitting mill is projected here by W. B. Chandler.

Massachusetts, Boston. The Boston Knitting Mills, S. Cohen, manager, at 10 Bridge Street, East Cambridge, have been absorbed by the Union Overall Co., which will continue same as a department of their plant. They start with 6 machines, which will eventually be increased.

*Massachusetts, Lowell. The Hooper Knitting Company's plant has been purchased by the United States Shuttle & Bobbin Company, which will establish a plant here.

Massachusetts, Lowell. The Waukenhose Co. has twenty machines in operation and are increasing same. F. A. Dutton is superintendent of the plant.

*Massachusetts, Lowell. The building of the Hooper Knitting Co. has been sold to a Providence concern. The knitting, finishing and dyehouse machinery are for sale, as the company is going out of business.

Minnesota, Minneapolis. The North Star Woolen Mill has removed the New York office from 149 to 141-147 Fifth Avenue.

Mississippi, Port Gibson. The Fonda Knitting Mills, of Fonda, N. Y., are reported as communicating with parties interested here, regarding removal of plant.

New York, Cohoes. The Victor Knitting Mills Co. is operating No. 2 and No. 3 carding rooms night and day.

*New York, Cohoes. The Riverside Knitting Mills, of which H. M. Sweet is receiver, have been shut down.

*New York, Cohoes. The Cohoes Knitting Company's plant is to be torn down and a modern structure erected for stores and offices.

Pennsylvania, Philadelphia. The Perseverance Mill, of which Thomas W. Greaves, 4947 Wakefield St., Germantown, is the proprietor, is running full time with many orders on hand, on cotton seamless hosiery. This mill operates 200 knitters and 25 sewing machines, with a production of about 700 dozens. The goods are sold direct.

Personals.

F. Cole has resigned as overseer of knitting at the Himes Knitting mill, Cohoes, N. Y.

James Usher, who has for some time past been assistant superintendent in the Bristol Mfg. Co.'s mill, Plainville, Conn., has resigned.

Edward Donhei, overseer of spinning in the Alpha Knitting Co., Schenectady, N. Y., resigned recently, and has been succeeded by Mr. Gavitt, who had formerly been employed by the Wayside Knitting Co. at Troy.

New Machinery and Processes.

This department is designed to present from month to month a brief mention of new machinery, devices, and processes being brought out in this country and abroad, that are of interest to textile manufacturers. It is not a list of patents, but of improvements coming on the market. The idea being to present to our readers a systematic monthly record of new machinery, etc., of interest to textile mill men.
We invite machine builders and others to send us such information for this department.

Open Width Cloth Extractor. Wyman Eaton, Dolgeville, N. Y. An improved horizontal open width cloth extractor, a description of which appears in this issue.

Carboy Holder. The Carboy Inclinator Co., Philadelphia, Pa., is placing on the market an improved holder for carboys which is claimed to be very simple and effective. Every dyer who has occasion to handle acids and other liquids that come in carboys will appreciate a ready means of pouring the liquid for use.

Cloth Trimmer and Inspection Table. Curtis & Marble Machine Co., Worcester, Mass., are placing on the market an improved cloth trimmer and inspection table. The cloth is first brushed by two rotary brushes and then passed over the table in view of the inspector, then to the roll on which it is wound.

Cloth Expander Attached to Calender. We learn that the Mycock patent regulating cloth expander manufactured by Thomas Leyland & Co., 53 India St., Boston, is being used with much success when attached directly to a calender, particularly on all sorts of medium and soft finished goods. This does away with the use of the belt stretcher and shows considerable saving in labor. By its peculiar construction it opens out the fabric without damaging it in any way, and prevents "bowing" and distorting of the weft because all parts of the cloth travel through the expander under the same tension and speed.

Double Cylinder Card. Arnold Braun, Hergenrath, Germany, is placing on the market an improved double cylinder card, which is described in this issue.

Rag Shaker. Walker and Smith, Batley, Yorkshire, Eng. A machine to remove the dust and dirt from rags before they are run through the picker. The builders claim that it will do two to three times the work of the ordinary machine, and that its chief advantage is that it takes the threads from the rags, an operation that is now done by hand.

Automatic Loom. The Burnley Automatic Loom Co., Ltd., Manchester, England, have recently brought out a shuttle changing attachment for looms, the invention of Bernard Crossley. It is said that a loom fixer can apply it to any ordinary loom in two or three hours. A manufacturer using it states that it is not unusual for a loom to stop only once or twice during an actual working day, and then for the piecing of warp threads. A speed of 210 picks per minute with 40-inch reed space on 14s filling is said to have been reached with good results.

Wool Washing Machine. John Dawson, Milnrow, England. A new wool scouring machine, the improvements consisting in the method of moving the wool through the liquor with the forks.

Thread Guide Board. Burton Shaw, Manchester, England, has lately placed on the market an improved thread guide board. Instead of making the board in sections it is made in a length equal to that of the machine. The wooden lifting board is dispensed with and the guides are fastened direct to a hinging board.

Double Cylinder Jacquard. Samuel Dracup, Bradford, England, recently put on the market a new double cylinder jacquard motion which, it is claimed, overcomes many of the difficulties heretofore found in this special type of head motion. It is claimed that it is as simple as a single cylinder motion.

A PINLESS DRESSING REEL.

Section streaks are the bane of sectional warping on reels. There are a variety of causes for them, but none more fruitful than the improper setting of the pins. Bad streaks are sometimes caused by the irregular tension on the spools, especially when the latter are set in a double row. This particular cause is easily remedied by setting the spools in one perpendicular row so that the threads from each spool are distributed across the entire width of the section. If, under these conditions, there is any difference in the tension between the spools the effect is uniformly distributed across the warp.

This single row arrangement of spools is the one commonly in use so that the causes of sectional streaks are now confined almost entirely to the adjustment of the reel and the pins. If the pins are not in line the space between them for the yarn will vary in different parts of the reel; in the narrow parts the yarn will pile up on one side, subjecting the yarn to unequal tension and causing a streak in the cloth. In time the pin holes become worn and in this condition the pins tip to one side, causing an irregularity of the section spaces. The pins are also likely to drop out when the holes become enlarged, causing an irregularity in the section.

Another common cause for section streaks is the improper adjustment of the reel to the throat reed, causing the yarn to pile up and become stretched on one side of the section. With the ordinary pin reel it is extremely difficult to obviate section streaks in fine closely sheared goods or in fabrics made with warp and filling of contrasting colors. At first thought it would seem as if pins were essential to sectional warping, but a glance at a warper in operation and equipped with the pinless dressing attachment built by the Chowen, Hartley and Main Mfg. Co., Peterboro, Ont., and Lowell, Mass., demonstrates that pins on sectional warping reels are entirely unnecessary. That glance also excites surprise that pins have been used so long on sectional reels. The pinless process is so simple that it can be described in a very few words by the aid of the sketch at Fig. 1.

The first section is started with the out-

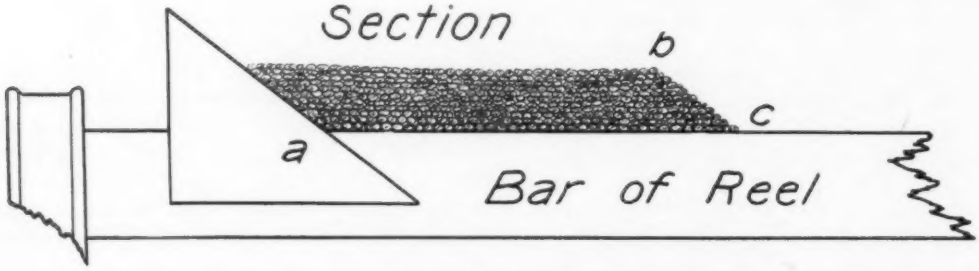


FIG. 1.

side edge at the point A, where a beveled form intersects the dresser reel. As the section is built up a simple mechanism shown at Fig. 2 moves the reel slowly to the right in the direction of the arrow so as to keep the outside edge of the web against the beveled frame. The inside of the section assumes a corresponding bevel at B C, and the succeeding section is wound against the bevel at B C, in the same way as the first one was wound against the wood form. The warp is finished in this way and when it is wound on the beam the motion which moved the reel to the right when the section was being wound, works in the opposite direction and moves the reel slowly to the left, thus keeping the yarn in line with the beam.

A very important feature of the machine consists in the arrangement for adjusting the reel when starting a section. By an ingenious device the movement of the reel on the track operates a dial on which a hand indicates the point at which the reel should be brought in order to bring it in front of the throat reed. Without this device the warper lines up the reel by sighting across it to the

reed, and the most experienced workman is unable to set the reel right at the first attempt. He watches the yarn during the first few turns and yanks the reel either to the right or left to bring the web in line with the pins. This haphazard style of working is entirely obviated by the use of the dial just referred to.

From the preceding description it will be evident that the Chowan, Hartley and Main Mfg. Co.'s pinless reel is a marked improvement in sectional warping. We lately saw one of these reels in successful operation and were assured by the superintendent and the dresser tender that it was entirely satisfactory. The attachment can be easily applied to any reel. An old reel which has become practically useless on account of the wearing of the pin holes is, with this attachment, as good as new. The time saved in changing pins is an important item and enables the dresser tender to do much more work, especially where there is frequent occasion to change from one set of the reel to another.

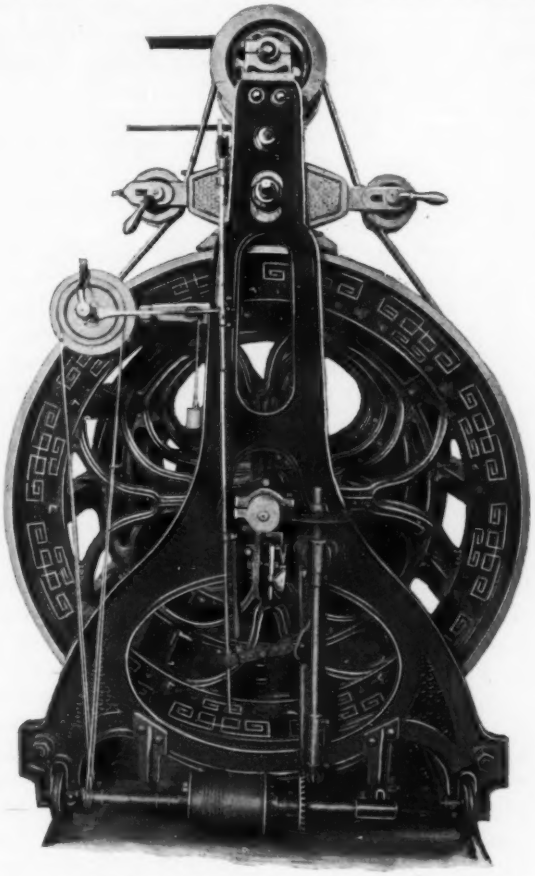


FIG. 2. THE CHOWAN, HARTLEY AND MAIN PINLESS DRESSING REEL.

The pinless reel is giving satisfaction in mills in the United States and Canada. Following are a few letters from manufacturers using it:

Markham, Nov. 30, 1903

Messrs. Chowen & Hartley, Peterboro, Ont.

Dear Sirs: Your favor of the 28th inst. received and in reply would say that the pinless dressing attachment is giving perfect satisfaction. Before using this attachment we were troubled very much by section marks

something we rarely see now since getting this attachment put on. Yours truly,

Maple Leaf Woolen Co.,
T. B. Umpleby, Supt.

North Andover, May 2, 1904.

Messrs. Chowen, Hartley & Main Mfg. Co.,
Peterboro, Ont.

Gentlemen: We find that the pinless reel works very satisfactorily and does all you claim for it on our work. Yours truly,

Suttons Mills,
Harry Sutton, Supt.

Peterboro, Ont., May 16, 1904.

Messrs. Chowen, Hartley & Main Mfg. Co.

Dear Sirs: We have much pleasure in recommending your attachment for the warper and certainly think no manufacturer should be without the same, as it saves time and section marks, also prevents the breaking of the warp in beaming off. Yours truly,

Auburn Woolen Co.,
Jas. Kendry, Pres.

Further information can be obtained from the builders.

THE BELL SYSTEM OF VENTILATION AND HUMIDIFICATION.

The importance of preserving a proper degree of humidity in working textiles has long been known, and in the last few years the subject has been studied from a scientific standpoint. First there was a recognition that textile manufacturing, particularly of cotton and wool, went more smoothly and successfully in certain climates than in others. Thus, Lancashire, and the region around New Bedford, have climates notoriously well fitted for cotton spinning and weaving. But even in these favored spots the climate is not at its best through the entire year, and a certain amount of moisture must be maintained in the workroom to ensure the best results.

In the first place, the material worked in a dry room soon becomes rather strongly electrified, so that the fibres of the yarn stand out, giving it a fuzzy surface, and the loose ends being broken off in the working scatter an amount of lint that not only represents real loss of material, but makes the manufacture uncleanly and the yarn uneven, requiring extra care in inspection. The electrification can be checked by working in a moist atmosphere, which, being a fairly good conductor of electricity, prevents its accumulation on the material, with the evils that result. Secondly, quite apart from electrification, the fibres when slightly moist lie together more smoothly and work more uniformly in spinning and weaving. Finally, in certain cases, like the manufacture of tops, it is important that a uniform amount of moisture should be carried by the product, so that when sold it shall represent a fair and uniform weight of fibre.

These requirements are clearly understood by manufacturers, and further, the necessity of artificial moistening to preserve uniform conditions throughout the year, irrespective of external changes, becomes obvious.

The object of The Bell System, controlled by the Bell Pure Air and Cooling Co., 97 Cedar Street, New York, is to preserve throughout the year the best conditions of the best climates for textile working. Since each class of textile manufacture requires its own conditions of humidity to produce the best results, the aim of the Bell system is to permit such easy regulation of the conditions that the climatic conditions required may be duplicated and varied according to the needs of the work, while kept uniform so long as uniformity is demanded.

For cotton mills, the best average results seemed to be obtained at temperatures of 75 to 80 degrees, F., with relative humidity of 70 to 60 per cent. In the effort to preserve this condition the temptation is to neglect ventilation, which not only injures the health of the operatives, but by the very fact of harming them tends to injure the output. It is claimed that the Bell auxiliary system of ventilation both ventilates the room and supplies it with properly humidified air. It consists in taking in a steady fresh air supply, passed over the heating coils when necessary, adding to it the required amount of humidity, which is automatically regulated within fairly close limits, and delivering it thus moistened to the workrooms.

The Bell humidifying apparatus does not necessarily involve a system of ventilation.

The Bell Co. state that it can with equal facility be run purely for moistening, so as to provide an atmosphere of the required character with as much or as little ventilation as circumstances may demand. The humidifying apparatus by itself requires no outside connections, takes up no floor space, being arranged for suspension or bracketing, demands no piping system, and consumes very little power.

The company claims that an essential feature of the machine is that it delivers, not a spray, but air carrying the requisite moisture as aqueous vapor, just as it is found in nature.

The claims for the Bell system are summed up as follows: The degree of humidity can be regulated with the greatest ease if unusual power of regulation is needed, and there is no tendency to distribute the moisture unevenly; while, once set to produce a given humidity, no further regulation is needed under ordinary variations in the external conditions. If the humidity rises the humidifier adds less aqueous vapor to the air which passes through it. If the relative humidity falls the air receives more moisture automatically in the machine. The humidifier is not complicated, and requires a minimum amount of care. It will not clog or fail of its functions so long as it receives the water which it distributes, and will provide a better atmosphere and keep it more uniformly good than any humidifying apparatus yet devised. It ventilates and moistens, delivers and distributes the moisture in the natural form of aqueous vapor, and can duplicate the hygrometric conditions of any climate desirable in textile manufacture. It tends to lessen the extremes of temperature, as well as to provide uniform humidity. It does all this in a self-contained apparatus, which can be applied to one room or to a whole mill with equal facility, can be installed and maintained at moderate cost, and will do its appointed work steadily and thoroughly. It is based on scientific principles, and carries them out in a practical, simple and efficient manner.

The Bell Co. invite correspondence in regard to this system and will furnish further information on application.

THE CROMPTON-THAYER WOOLEN AND WORSTED LOOM.

The new fancy loom company of Worcester, Mass., organized under the name of the Crompton-Thayer Loom Company, has within a few months placed on the market a new full fancy loom for weaving worsteds and woolens. It is built on the open shed principle and we show herewith several illustrations, presenting different views of the loom. We are informed that some very broad claims have been allowed by the patent office, where over a dozen patents of theirs are now pending.

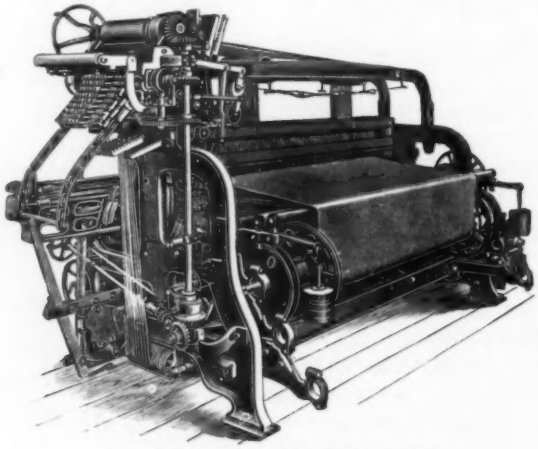
Throughout the whole construction of their worsted and woolen looms the greatest possible care has been used to simplify the old motions, which have stood the test for years. Without disturbing the principles of these devices, the company has aimed to strengthen the parts and do away with all superfluous mechanisms, and the claims applied for and allowed show the novelty of the inventions.

Fully as much attention has been given to the strength of the loom as to the simplicity of its working parts and especial attention has been paid to the rigidity of the frame, which alone, we are informed, weighs about 300 lbs. more than other worsted or woolen looms now manufactured in this country. All the principal working parts and those that are submitted to the most strain are made of malleable iron or forged steel. The workmanship and finish have nowhere been neglected. It is a practice of the company to thoroughly test all their looms and in most cases actually run them under the belt before shipping, in order to guard against faulty material or a slip on the part of a workman.

Among the most important patentable features of this new worsted loom is the fast and slow continuous motion of the cylinder shaft. The method covered by this patent, which is now pending, but for which the claims have already been allowed, is that of running the cylinder with a single pair of peculiarly shaped gears direct from the upright driving shaft of the loom instead of through the shell

gear and thence through a set of seven elliptical and straight gears. In this way the head motion is simplified by several gears, and the cylinder receives its power in the most direct manner. The illustration herewith given shows the arrangement of this motion, and will appeal immediately to the mechanical sense of those familiar with this class of weaving machinery.

So novel is the arrangement of this motion that the Boston Gear Co., who cut these gear patterns, requested permission to have on exhibition at their works a part of these gears, as they had nothing like them in their assortment, which is the largest of its kind.



THE CROMPTON-THAYER FANCY LOOM.

Among other important features are the spring followers supplied with a spring releasing motion and a lifting device which simultaneously lifts and holds all the followers out of engagement with their respective levers. The customary method of building these spring followers requires for a 25 harness loom 50 needles and latches, or for a 30 harness loom 60 needles and latches; in the new loom these spring followers use a draw spring and in that way entirely do away with the need of any needles or wires wherein a crush spring is used, and by the use of the single evener which lifts and holds in an elevated position all the followers, 25 or 30 of the individual latches, according to the number of harness used, are dispensed with. For these devices separate patents have been applied for and basic claims have been allowed by the patent office. Especially is this true of the release spring device, and the Crompton-Thayer Loom Company claim that any attempt to release the tension of the springs on an open shed head motion employing vibrator gears and suitable connection to the harnesses, would be an infringement of their patent.

Beside these improvements an entirely new style of crank shaft box is used on all the looms built by the new loom concern. This new box requires no set screws to hold its cap in place; a single bolt having been substituted for the four conventional machine screws. By the employment of this bolt, which is run through the box and its cap in an oblique line, all tendency for the cap to come off or even to become loosened is eliminated; furthermore there is no thread to be ripped out as the box and cap are not tapped in this case. This box is so simple and neat in appearance that it has been commended and ordered for their looms by the manufacturers who have seen it.

Another very simple and effective device for which a patent has been applied, is the pitman or lathe connecting arm. Again, this device, which is adjustable and which can be operated by the weaver, thereby doing away with the fixer's wrench, and also with the tendency of the lathe to loosen from its connector, is simpler in every way than the old fashioned arm, and

by its use obviates in a great measure the principal cause of break downs.

We are informed that the new company has received its full share of orders for worsted looms that have been placed since the introduction of their machine, and are running their works with a full force on a twelve-hour schedule. To do away with night work and to meet their increasing orders for all kinds of fancy looms, the company is adding to its present plant and constantly placing orders for new machinery of the most modern type.

The Crompton-Thayer people having had the best expert and legal talent inspect their looms, state that they guarantee the new loom absolutely clear from any infringement and invite the closest inspection by manufacturers, machinery builders and loom experts.

VIM MECHANICAL LEATHERS.

Some remarkable claims are being made in the advertisements of E. F. Houghton & Co. of Philadelphia, about the leather which they sell under the trade-mark, Vim, and which is known generally as Vim Mechanical Leather.

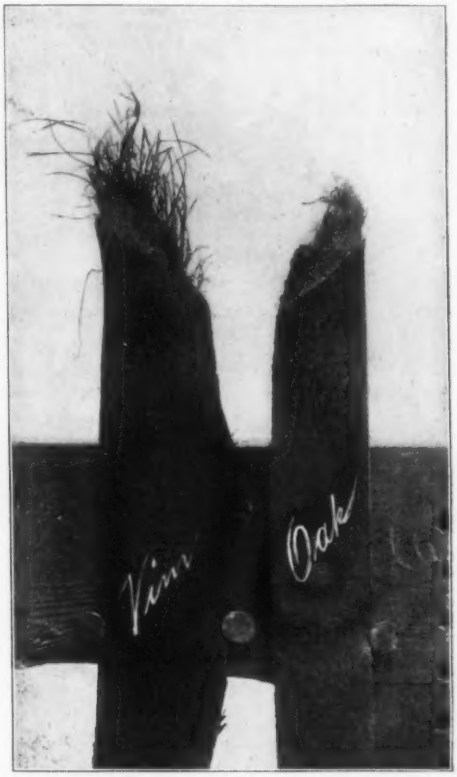
It is finished in all forms for mechanical purposes, such as belting leather, mill strapping, oily picker leather, coverings for worsted rolls, worsted apron leather, stainless picker leather, hydraulic packings, friction discs, etc.

They claim the Vim leather will last about twice as long as any other make, and that this lasting property is due to the fact that the Vim process of tannage produces a leather with a longer and stronger fibre, and a fibre that can be better lubricated.

Those interested in mill strappings appreciate that the expense of stopping and fixing a piece of machinery is usually much greater than the original cost of the broken strap, and may be interested in investigating the claims and the tests by which the manufacturers demonstrate in a very practical way what the leather will do.

They submit a piece of leather cut so that its strength can be tested as compared with oak. It is seldom that a piece of oak leather cannot be torn by a strong man who will very seldom find a similar piece of Vim leather that he can tear. They boil a sample of Vim leather in water for a few minutes along with a piece of oak leather. The oak leather comes out worthless; the Vim leather unaffected. They submit a photograph of a piece of Vim leather and one of oak leather, which have been broken by tensile strength, showing the additional length in the fibre of the Vim leather.

Manufacturers of textiles appreciate that it



TEST OF VIM AND OAK TANNED LEATHER.

is length, strength and lubrication of fibres that makes strength in a fabric. If they have what they claim, it is something that every mill is interested in.

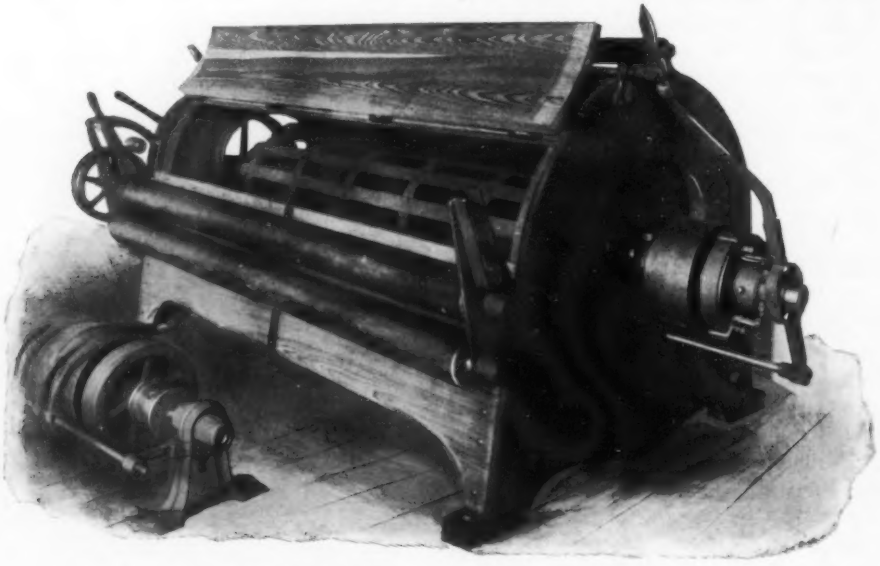
If we are correctly informed, Messrs. E. F. Houghton & Co. ask no payment until they have demonstrated what they have claimed.

These leathers are neither new nor experimental. They have been on the market for some three years, and are in use by many of the largest and most intelligent manufacturers in the country.

THE EATON IMPROVED HORIZONTAL CLOTH EXTRACTOR.

Extracting cloth on a horizontal machine has much to commend it to textile manufacturers. The water is extracted from the fabric while the latter is wound in open width without wrinkles on a smooth roll. In this condition extractor wrinkles or streaks become an impossibility. The liability to explosion is reduced by the fact that the cloth is wound tightly on the roll and serves to strengthen the machine and counteract the centrifugal force. Keeping the cloth in the open width during the extracting process is, however, the chief advantage from a technical standpoint. It is a well known fact that the finish of face goods and closely woven fabrics in general is often impaired by a disturbance of the face of the cloth during the extracting process when the pieces are jammed tightly into the extractor basket and then revolved at the necessary speed for removing the water.

The principle of the open extractor has been thoroughly tested for years in many mills in this country and abroad, and the machine shown in the accompanying illustration, built by Wyman Eaton, Dolgeville, N. Y., embodies all the features which experience has found to be of value in an open extractor. It is very heavy and strongly built in order to overcome the vibration due to the high speed of the drum when in motion with the goods wound on it. It is also made with as few parts as possible, which have all the requirements necessary for the proper working of the machine. The cylinder or drum is made with six heads keyed to a shaft. Fastened securely to these heads are twelve wrought iron slats which form the drum, the diameter of which is 20 inches; the length of the slats or width of the goods that can be handled is 85 inches. A row of sharp spurs is inserted in the edge of one of the slats, to which is hooked a piece of canvas or other suitable material, passing around the drum for the purpose of keeping the goods clean and also having cords attached for fastening the end of the sheet of goods to be wound on the drum.



THE EATON HORIZONTAL CLOTH EXTRACTOR.

In operating the machine, the belt for driving the overhead counter-shaft is shifted to the tight pulley, and the belt tightener, by means of the lever handle, is brought in contact with the down belt, which drives the drum through the flanged pulley, at this end of the machine. This gives a slow speed of

16 revolutions per minute, allowing the operator to guide the goods upon the drum. To hold the goods in place, a rope 5/8-inch in diameter and 140 feet long is used. One end of this rope has a loop which is passed over one of the hooks at the left hand end of the drum, and from there straight across the goods and under the hook at the opposite end; the end of the rope previously having been passed under and over the two rolls shown in front. The drum is again put in motion and the rope wound around the goods from end to end of the drum, and is secured by drawing it through under one of the coils of rope. The lever for starting the friction driven pulley at the other end of the machine can now be operated, causing the drum to revolve at a high rate of speed; the centrifugal force causing the water to be extracted and thrown to the outside; the waste water being caught and carried off through the holes for this purpose at each end of the machine. The stopping of the drum is accomplished very quickly after throwing out the friction clutch lever, by aid of a powerful foot lever brake convenient to the operator.

To unwind the rope and sheet of goods, the reverse belt on the counter-shaft is brought into play, reversing the motion of the drum, allowing the goods to be either taken off on a truck, or wound up in a roll, by placing a suitable wooden roll in the slotted castings on top of the power driven roll, in front of the machine. This roll is also driven by means of a belt tightener, worked with a hand lever as shown. It will be noticed that the friction pulley can be worked from either end. The counter-shaft for the slow motion is so placed overhead that the belt shipper handle comes within easy reach of the operator, bringing all the operating levers so they can be worked from the same end of the machine. Between the drum and woodwork there is a clear space of 14 inches for the goods, the inside diameter of the woodwork being 48 inches. This enables a large quantity of cloth to be extracted at one time and results in a large production. Further information regarding the machine can be had upon application to the builder.

PNEUMATIC PAINTING AND WHITEWASHING MACHINE.

Machines for applying paint and whitewash have been in successful use for many years and their merits thoroughly demonstrated by practical experience. There are many advantages in using machines for this work. Great saving of labor is effected, one machine attendant being able to do the work of many hand workers. There is no spattering of the liquid, which is applied more uniformly than is possible with a brush.

The accompanying illustrations show a coating machine manufactured by J. A. del Solar, 108 Fulton St., New York City. Fig. 1 is the Best automatic coating machine with

FIG. 1. THE DEL SOLAR WHITEWASHING MACHINE.

a 2 1/2-inch pump and 8-inch receptacle 24 inches high. It is claimed that one man with this automatic machine can cover 20,000 square feet of surface per day, while one man with a brush does well to cover 1,000 square feet in the same time.

The machine consists of a specially designed liquid and air pump having a patented expansive plunger which does not come in contact with the liquid, also a large steel receptacle and pressure gauge in which the

liquid and air are compressed. Each machine is equipped with 25 feet of high grade 1/2 inch pneumatic hose and an extension rod for reaching overhead ceilings without the use of scaffolding, also two nozzles and suction hose with strainer.

The automatic machine can be used for

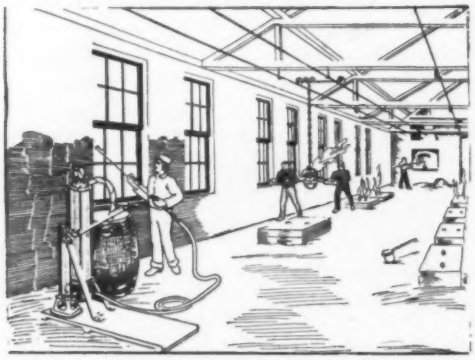


FIG. 2.

whitewash, cold water paint, spraying paint or any other liquid that can be formed into a spray. The manufacturers state that the average labor cost of brush work is 12 to 15 cents per 100 square feet; that with this machine it is not over 1 cent per 100 square feet. The results are said to be much better than with the ordinary brush, as the spray penetrates crevices which could not be reached by the bristles of a brush.

Fig. 2 illustrates the ease with which the machine is operated, one man doing the work of twenty. It is said that with one of these machines one man can paint 20,000 square feet in 10 hours. Further information can be obtained by addressing the manufacturer.

Nosing Motion for Mules. Platt Bros. & Co., Oldham, England, have adopted an improvement in the nosing motion on their self-acting mules. It is designed to wind the yarn firmly when the carriage is completing its inward run and during the unlocking of the faller. The object of the device is attained by turning the spindles slowly while the guiding faller is rising.

Axminster carpets take their name from being first made in the town of Axminster in 1755.

THE EXCELSIOR WOOL OIL COMPOUND.

About four years ago what is now known as the Excelsior wool oil compound was first made by a European chemist. Shortly after it was exhibited and received a gold medal at the industrial exposition in Leipzig in 1901; also a silver medal at Cottbus in the same year. We are informed that this compound is now being used extensively in Europe with very satisfactory results. Manufacturing and sales rights have been secured for America by Schoen & Schlichter, Hamilton, Ohio, who are now offering to the American trade a product that is identical with that used in Europe. They state that it has been thoroughly tested in this country and refer to a number of their customers who are using it with entire satisfaction. They inform us that, as with other oils, the quantity needed depends largely upon the stock, and also the class of goods to be manufactured, and advise the use of 10 to 14 per cent. with 2 to 3 parts of water, for 100 lbs. of cotton; and 14 to 18 per cent., with the same proportion of water, for 100 lbs. of wool. Some spinners go much below these figures and get good results.

This compound will form and maintain an absolute emulsion if dissolved in hot water. In order to do this quickly, only one part of hot water should be used in connection with the compound, which is stirred until it is well dissolved, then the remaining quantity of cold water is added.

It is said that, besides being pure white in color and sweet in odor, it does not stain the fabric; its consistency is well proportioned, thus insuring to the fibre the highest flexibility and silk-like character, and that the stickiness and rancid smell, often experienced with unwashed yarns stored any length of time, is avoided.

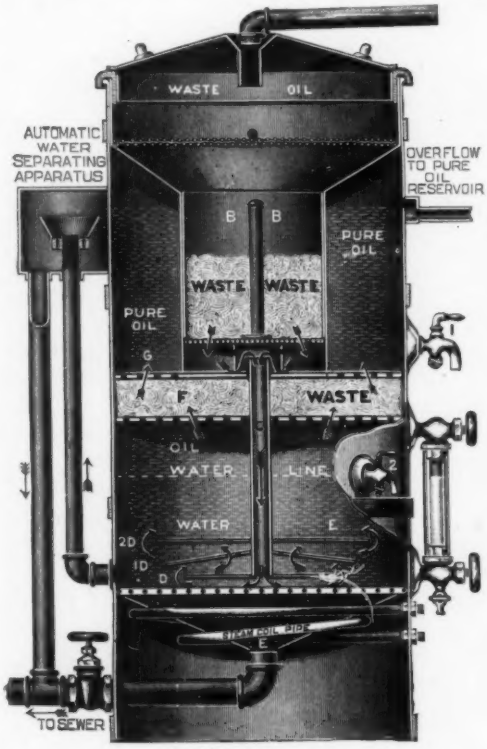
Further information regarding this compound can be had upon application to the manufacturers.

Intersecting Gill Box. L. J. Gruen, Gebweiler, Germany, is placing on the market an improved intersecting gill box which, it is claimed, does much better work than the ordinary gill box with the single set of gills.

SAVING CYLINDER OIL.

The Burt Mfg. Co., of Akron, Ohio, have for some years been making what they call their "Style B Oil Filter." This filter will take the condensation from the oil separators and exhaust heads, and automatically separate the oil from the water, and purify the oil at the same time, the oil going into the pure oil reservoir, and the water running from the drip into the sewer.

This filter is made in several sizes, from 3



THE BURT OIL FILTER.

to 500 gallons capacity per day. It is used by prominent concerns, such as the National Cash Register Co., U. S. Steel Corporation, Westinghouse Air Brake Co., Allegheny County Light Co., Edison Electric Light Co., and scores of others.

The modern engineering practice has made a device of this kind almost a necessity in every power plant, not only from a standpoint of economy, but as a part of every well-regulated engineering system.

The reputation of the Burt Mfg. Co. as the largest manufacturers of oil filters in the world is upheld in this class of filter. The manufacturers state that it works automatically, without care or trouble, when once installed in any power plant, and it pays for itself many times over in the saving of oil.

The oil and water are poured in the top of filter and then pass into chamber, B, through the layer of waste, which collects all the heavier impurities of the oil. From thence through the perforated bottom of chamber, B, down in the direction shown by the arrows into tube, C, and from here on to filter plate, D, where the increased weight of the water has a tendency to keep the oil back in tube, C. However, the pressure of oil in chamber, B, forces it down and spreads it out over plate, D, in a very thin film, which constantly changes surface and grows thinner as it travels from the centre to the circumference of plate, D, thus exposing every particle of waste oil to the action of the water. It then flows upon plate, D′ and D″, going through the same process in each case. When the oil leaves the filter plate, D″, it is in a finely divided state of separation, and thoroughly mixed with water, which washes it out, and from which it separates by gravity all the remaining impurities, which settle in chamber, E, and can be removed by opening the gate valve at bottom of filter, which drains off all the water and dirt. From plate, D″, the oil again filters through the stratum of filtering material, F, and from there it rises to the pure oil chamber and then flows to the oil reservoir.

The water is automatically separated after it passes down the tube, C, and reaches the bottom plate, as the oil being lighter than water, just as soon as it reaches the bottom of filter, it immediately rises and the surplus water passes into the tube which leads to the automatic water separating device.

As cylinder oil is the most expensive oil used around a plant, the saving effected by the Style B filter is a large one; this reclaimed oil can be used to lubricate pumps and other machinery, thus cutting down oil bills very materially.

The Burt Manufacturing Co. have their filters adopted by nine foreign governments, and in use by most power plants of prominence in the country.

Dyeing, Bleaching, Printing, Etc.

DIAZOTIZING AND DEVELOPING WOOL.

BY J. J. WITTENBERG,

Winner of the Textile World Record Gold Medal for General Excellence in Dyeing and Chemistry at the Philadelphia Textile School, 1904. The following thesis was written in competition for the medal.

Little work has thus far been conducted on the subject of diazotizing and developing of wool.

Richards, in 1889, outlined a brief series of experiments supporting his view of the fact, that the behavior of wool toward coloring matters is like that of an amido acid; being basic toward acid colors, and acid toward basic colors.

Thus, wool treated with nitrous acid soon becomes yellow, and is presumably diazotized. If subsequently treated with solutions of various phenols and amines, a variety of colors (azo dyes) is produced on the fibre, according to the nature of the developer employed.

Phenylene diamine yields shades ranging from a light salmon to a full reddish brown; depending upon various conditions, such as the nature of the wool, the temperature of diazotizing and developing baths, and also the strength of the diazotizing bath, as will be seen later.

Toluylene diamine yields brown shades.

Blue Developer, A. D., greenish.

Blue Developer, A. N., light brown.

Resorcine, yellow to granite red.

Phenol, yellow to orange.

Beta naphthol, yellow to granite red.

Alpha naphthol, yellow to granite red.

Naphthylamine ether N., yellow to reddish brown.

Naphthylamine ether pdr., light to dark brown.

Phenol, under all conditions, yields the lightest shades.

The introduction of two hydroxyl groups in the developer (as when resorcine is used), causes the shades produced to be somewhat heavier and yellower. The naphthols show but a slight increase in depth of color, whereas the naphthylamines suffer a decided loss in brilliancy, but a slight increase in intensity. Upon replacing the hydroxyl by amido groups, as in the case of phenylene diamine, the resulting shades are considerably darker and of a reddish cast. The introduction of a methyl group into the benzine ring, together with two amido groups, forming toluylene diamine, yields heavy shades of a more or less brownish cast. Blue developer, A. N., is an amido naphthol sulphonic acid containing only one amido group, and does not give as full a color as phenylene diamine, which has two amido groups. Blue developer, A. D., amido diphenylamine, containing three amido groups, produces colors entirely different from any of the foregoing. The shade instead of being yellow, reddish or brown as heretofore, acquires a greenish or bluish cast.

As before stated, the effectiveness of diazotization and developing and the character of the shade produced, are more or less altered by the varying conditions of the wool. Wool

in the following conditions was subjected to the process:

1. Scoured wool.
2. Bleached with hydrogen peroxide.
3. Bleached with sulphurous acid.
4. Bleached with sulphurous acid and chlorinated.
5. Wool steeped in a 10 per cent. solution of nitric acid for 12 hours.
6. Wool steeped in 10 per cent. ammonia for 12 hours.

Bleaching the wool tends to make the diazotizing bath more active, and also causes the formation of a darker color with the developer. A distinction must be made between the various bleaching agents as they do not give the same results. Wool bleached with hydrogen peroxide previous to diazotization yields shades a trifle heavier than those produced on the unbleached fibre. The action of sulphurous acid is, however, quite marked and characteristic. This is especially true when the amines and phenols act as the developer. The shades in general are heavier and of a reddish cast. This would tend to show that the sulphurous acid had in some manner combined with the amido base of the wool fibre.

Chlorination of the fibre plays quite an important role, regarding the shade produced upon diazotizing and developing. With all the developers, except the phenols and naphthols, the depth of shade is increased considerably; quite the same as in dyeing chlorinated wool with azo dyes. It is rather difficult to determine the true action of free chlorine on the wool fibre, but without doubt a chemical compound is formed which causes the wool to have an increased affinity for dyestuffs. When wool is steeped in a 10 per cent. solution of nitric acid, it gradually turns yellow, due to the formation of xanthoproteic acid. Upon diazotizing and developing wool treated thus, the shade is but slightly altered. It tends to leave the shade somewhat yellower, due probably to the simple nitration of the wool. Wool which is simply nitrated produces no change in color with the phenols.

The action of ammonia is quite interesting, as it shows a distinct increase in the depth of the shades produced with the various developers. It is especially noticeable with the naphthols and phenols. The shade in all instances is darkened, the tone remaining the same, whether the ammonia was applied to the wool base or the diazo body formed by the action of sodium nitrite on the base. The latter yields the heaviest shades. It is thus clear that the wool has undergone some change with the sodium nitrite which renders it capable of combining with the developers, as the diazotized amines do.

From the above results it is quite natural to suppose that a diazo compound of the wool is formed; being, however, much more stable than the ordinary diazo compounds. Boiling the diazo body with hydrochloric acid does not destroy it completely; it may be dyed with diazo naphthalene chloride, and it appears that a phenol is liberated in the fibre, produced by the decomposition of the diazo compound on boiling. These reactions tend to show that wool may be regarded as a primary amido compound, as it displays the properties of such a body.

On comparing with a primary amido compound such as aniline, it was found to be similar in its reactions. Aniline on being diazotized is turned yellow. On heating, effervescence occurs and the smell of phenol is perceived. Again upon bringing a solution of phenol in caustic soda in contact with the diazo compound of the aniline, an orange red color is produced. Likewise other developers may be employed producing similar results.

The temperature of the diazotizing and developing baths is also an important factor, as will be seen from the results of the tests made under the following varying conditions:

1. Diazotized with 10 per cent. sodium nitrite and excess of hydrochloric acid; cold. Developed with 10 per cent. developer, cold.
2. Diazotized as above. Developed at 180 deg. F.
3. Diazotized at 180 deg. F. Developed cold.
4. Diazotized at 180 deg. F. Developed at 180 deg. F.

It was observed that Blue Developer, A. D., produced entirely different results under the various conditions. The difference in

tone of color is not very marked, whether the diazotizing bath is hot or cold, as long as the developing is done cold. The former, however, produces colors much more brilliant.

Having noted the influence of heat on the diazotizing bath, its influence on the developing bath was next observed. When the diazotizing is done cold and the developing done at 180 deg. F. the color was much duller than under the foregoing conditions; whereas when the diazotizing and developing were both done at a high temperature the color was more brilliant and of a yellowish cast. With Toluylene diamine the variation in temperature does not produce as marked a change as with the above developer. The most brilliant colors are obtained when the diazotizing was done hot and the developing cold. The most intense color is obtained when the diazotizing is done cold and the developing hot, but when both are heated, the color shows a slight increase in brilliancy.

Again with phenylenediamine the most brilliant colors are produced when the diazotizing bath is heated and the developing done cold. There is a marked decrease in the intensity and brilliancy when diazotized cold. On raising the temperature of the developer bath the color shows a further decrease in brilliancy, but a very marked gain in intensity. When, however, both operations are carried out hot, the color shows a loss in intensity and a marked gain in brilliancy over that produced with cold diazotizing and hot developing. With naphthylamine ether, the colors produced under the above conditions exhibit marked differences. The lightest shade is gotten when both diazotizing and developing are carried out cold.

When the diazotizing is done hot and the developing cold the resulting shade is much more brilliant and intense, with a decided yellow cast. Heating the developer causes the color to assume a reddish cast, being most intense when the diazotizing is done cold. On heating both baths the color loses its intensity and appears with a more or less yellow cast. This tends to show that the best results are obtained when the diazotizing is carried out at a high temperature; but more brilliant colors are obtained when the developing is done cold.

The strength of the diazotizing bath also marks a change in the shade produced. Wool diazotized with 5 per cent. sodium nitrite, and excess acid; developed with 10 per cent. phenylenediamine, yields a fairly deep brown; on increasing the per cent. of sodium nitrite to about 10 per cent., the shade is darkened and turned to a deep reddish brown. Other developers such as toluylene diamine and blue developer, show a similar behavior.

On combining the various developers, fairly dark and full shades may be obtained, ranging from yellow to orange, reddish brown, brown, green, bluish and grayish to black. To determine the fastness of the colors produced, acid, alkali and washing tests were made. Those obtained with phenylene diamine, toluylene diamine and naphthylamine ether are fairly fast to washing. The colors of blue developer, on the other hand, suffered some change. The acid has a decided influence on the colors obtained with the above developers; those of the diamine developers are altered considerably, assuming a distinct red cast, with a marked increase in depth of shade. The colors obtained with naphthylamine ether and blue developer suffer but slightly. Alkali also affects the colors produced with the diamines, imparting to them a yellow cast, with a decrease in intensity. The colors with naphthylamine ether are unaltered. Those of Blue Developer A. D. are darkened to a bluish slate.

Electrolytic Bleaching. The Electrizitats Aktien-Gesellschaft, Nuernberg, Germany, is placing on the market an improved electric apparatus for bleaching textile materials.

Automatic Bleaching and Dyeing Machine for Cops. J. Karge, Mulhouse, Germany, has recently brought out a machine for bleaching and dyeing yarn on the cop. It is claimed to be very economical in regard to dyestuff and labor and to give very uniform results. Samples of the work can be seen at our Boston office.

It is not known when the length of the cotton skein was established; the very earliest records of the cotton industry speak of it as measuring 840 yards.

THE PRINTING OF WOOLENS.

A recent request for a few brief details of the process for printing woolens is the excuse offered for the present article, for although there are a few good books on this subject, all treat the essential points mainly from a theoretical, rather than from a practical standpoint.

In the first place, the absolute cleanliness of the goods to be printed must be assured; if any oils or soap are in the fabrics, many of the desired shades may be so modified that they do not match the sample, to say nothing of unevenness which will surely result. The scouring should always be followed by a thorough rinse and then dried ready for printing, or, as is desirable in certain cases, to treat the pieces by one of the "preparing" processes, the details of which were given in the Textile World Record a few months ago.

If bleaching is to be done the use of either peroxide of hydrogen or of sodium is strongly recommended instead of the sulphur process, as it leaves the goods a permanent white, and besides should any of the bleaching liquors remain in the goods, no injurious results will be observed. The actual printing is done on either a cylinder machine or a perrotine, the former being the most common. The steaming, which fixes the dyes on the fibres, is done at a low pressure in a steam chest, and the control of this operation is always left to the care of a man of some experience and, as a rule, under the supervision of the boss printer.

THE COLOR SHOP.

Here is where the various printing pastes are made. It is equipped with steam heated copper pans of various capacities, each provided with hand or mechanical paddles to incorporate thoroughly the ingredients of the "colors" being made.

The color shop ought to be well lighted and ventilated, while the steam and water supply should be ample. As very many shades wanted are in small amounts, the equipment should include a supply of stoneware containers or mugs ranging from 1 quart capacity to 3 gallons.

All dry colors and chemicals must be kept in a room separate from the main mixing room, and which should be as dry and free from steam as possible.

WORKING FORMULAE.

Acid Blacks. There are many brands of acid black on the market, but as a rule they work pretty much alike. The only choice will be that of shade, and the color mixer must make his choice accordingly.

The following is a typical recipe for this color:

Acid black	70 parts
Thiocarmine paste	10 parts
Water	300 parts
Gum thickening 1 : 1 ...	310 parts
British gum	220 parts
Chlorate of soda	15 parts
Alum	15 parts
Oil vitriol	15 parts
Water	45 parts

Print, and steam in a damp chest.

The gum thickening is made by dissolving roasted starch or brown dextrine in an equal weight of water.

A black for printing upon a red ground is always prepared with the addition of a small proportion of an acid green to overcome the peculiar brownish tone that would otherwise result. The recipe is as follows:

Naphthol blue black	45 parts
Acid green	30 parts
Water	340 parts
British gum	420 parts
Ammonic oxalate	15 parts
Oxalic acid	30 parts
Water	120 parts

The so-called Solid Blues, much used alone or for producing modified indigo tones, are used in the following manner:

Solid blue	4 parts
Water	3½ parts
Gum thickening 1 : 1 ...	2½ parts
British gum	2¾ parts
Acetic acid	8 parts

The very fine soluble blues, known generally under the name of "pure blue" or "water blue" find a limited application, usually for dots and tracery. They are prepared with tartaric acid thus:

Dyestuff	55 parts
Water	415 parts
British gum	330 parts
Tartaric acid	35 parts
Water	165 parts

For indigo blue shades, the well known alizarine lanacyl blues and violets are much employed, either alone or in combination, giving very satisfactory results. Prepare the printing color with:

Dyestuff	30 parts
Water	330 parts
Gum thickening 1 : 1	320 parts
British gum	180 parts
Chlorate of sodium	10 parts
Water	30 parts
Acetic acid	100 parts

A very good substitute for indigo carmine is Thiocarmine R in paste. This substance is used in an ordinary paste thickening containing sodium chlorate and oxalic acid.

For the very fine light blue shades of a pure tone, the cyanoles are much employed. They are prepared as follows:

Dyestuff	20 parts
Water	280 parts
Ammonia water	10 parts
Gum thickening 1 : 1	300 parts
Dextrine	300 parts
Oxalate of ammonia	30 parts
Water	70 parts

Bright violet shades are frequently employed, and for their production the several makes of Formyl Violet are used. The printing paste is the same as for the solid blues. The various makes of Acid Green are used with the same formula.

Naphthol Green B is used chiefly to produce moss-green shades which are quite fast to light. The formula for printing is:

Dyestuff	60 parts
Water	440 parts
British gum	360 parts
Chlorate of sodium	30 parts
Water	60 parts
Acetic acid	40 parts
Acetate of iron, 22° Tw.	40 parts

Fast Yellow O. This is a most useful color and is of general application. It is used in an ordinary color paste with ammonic oxalate and acetic acid.

The usual line of Acid Oranges, Acid and Fast Reds, Cochineal shades, Scarlets, Rubines, etc., are best printed with the following paste:

Dyestuff	45 parts
Water	385 parts
Phosphate of sodium	30 parts
Water	70 parts
British gum	380 parts
Acetic acid	90 parts

The preceding notes will give a very fair outline of the several classes of colors used, and they can be considerably added to with others that are the result of experimentation, especially such as relate to the compound shades.

After printing and steaming, allow the goods to "age" or dry out partially in the air before washing, and when they are washed, use plenty of water, as this will overcome any tendency to "bleed."

In making up a new formula for printing, care should be taken to use no more color (dyestuff) than the printed goods can take up—in other words, do not use more color than is necessary to produce a desired result.

THE UTILIZATION OF MILL WASTE.

In all textile manufacturing plants there is necessarily a considerable amount of waste that cannot be economically recovered, while on the other hand, a large amount of valuable material is lost that could, with proper processes, be made to yield a fair revenue, and lessen, to some extent, the general expense account.

As a rule, waste recovery in this country is practically unknown because, except in very few instances, our manufacturers have not been brought to face the proposition from the same point of view that the European manufacturers have. In Continental mills, it is the universal custom to sort carefully all waste that permits of sorting, and to dispose of it to other branches of business when it is worked up into other manufactures.

In textile mills, especially such as do their

own scouring, the consumption of soap is very great, and the recovery of the fatty matters from the waste liquors is a subject of constantly growing importance, not only for the intrinsic value of the recovered fats, etc., but from a sanitary standpoint. In this country, river pollution has been usually overlooked by the health authorities, while in Europe, where the population is much more dense than here, the question is of serious importance, consequently it has been regarded as being cheaper to allow such liquors to flow away than to render them inert or otherwise purify them. Waste scour and wash liquors, when properly treated for the recovery of the fat, etc., are non-injurious when allowed to run into rivers.

A mill washing and scouring its own wool in large quantities should maintain a scientifically constructed plant to cleanse the stock properly, and leave it in a condition ready for manufacturing, and the only successful process to employ is that which is based upon the use of volatile solvents. Objections to this process have been made from time to time, but practical tests and demonstrations have shown that the quality of the finished wool, together with the value of the by-products recovered outweigh any objections that are possible to raise.

The ideal process for wool washing is first to treat the dry, raw wool with a fluid hydrocarbon, which will remove all traces of soluble fats, of which wools of average grade contain a fair proportion. After the wool has been thus washed, then remove the remaining traces of the hydrocarbon—which may be benzine—by means of a current of air, and then, without disturbing the wool, treat it with lukewarm water, which will dissolve the suint, certain dried exudations from the sheep, and which is rich in potash, readily recovered by evaporating these waters, and calcining the residue.

Wool, when treated by such a process, is absolutely pure, and free from any harshness, being only pure wool, and unlike many wools that have been scoured by means of soap, assisted with alkalies.

The benzine containing the fatty matters requires only to be distilled and condensed for continuous use, while the residue is valuable for its now recognized medicinal properties under the name of "lanoline." A mill having such a plant would not attempt to refine this residue, but dispose of it in the crude state.

In the yarn and piece-goods scouring department, where soap must be used, the waste scour liquors are always rich in spent soap, and these should be decomposed with acid to neutralize the alkali always present, and at the same time to set free the fatty acids, termed the "magma." The composition of these acids is very complex, and while they find but little use directly in the mill, have a value for making certain kinds of soaps for various purposes.

The practical recovery of the "magma" is to collect the waste scours in a large wooden tank, and to neutralize with sulphuric acid, when a dark brown, dirty mass separates. The entire contents of the vat is run into a series of V shaped felt filters, which retain the "magma," and allow the clear acid liquors to run through. After a rest of 6 to 8 hours, this "magma" is scooped out, and put in filter bags, and subjected to pressure in a heated filter press, when the clear melted oils and fatty acids pass through and are collected in barrels. The residue in the filter bags is usually burned under the boilers, or otherwise disposed of, but it should be looked into more closely by the chemist, as it is quite rich in nitrogen.

The oil that comes from the filter press is brown in color, contains considerable fine dirt, but by hot filtration yields a product that is clear and light colored. Heretofore, this oil, known variously as "black oil" or "Yorkshire grease," has had but a meagre demand, but now there is a considerable market for it. Soap making has taken large quantities, while it has some properties that commend it to the manufacturer of certain kinds of leather.

Reference was made above to the use of benzine as a clearing solvent for wool. As this is the cheapest hydrocarbon, its use for this purpose is the most general, but now that carbon disulphide is being produced in large quantities, and the electrolytic production is likely to yield ever increasing quantities, so that its price can come to such a point that

wool scourers can use it with more freedom. Carbon tetra-chloride, however, is the most promising solvent as it is free from the usual dangers associated with benzine or carbon disulphide. The tetra chloride is non-inflammable, but its price is high.

Wool scouring with volatile solvents is not an experiment today. It is in successful operation in quite a number of large mills, and every year adds to the number, and although the tendency is for the large mills to adopt the process, it is only a question of time when mills of moderate size will erect suitable buildings for this purpose.

The waste problem is a very important one, but the systematic conversion of waste into marketable product is of much greater importance, and while the recovery of the valuable portions of waste liquors may seem somewhat trivial, a study of the entire subject may lead to other conclusions. Not alone must the value of the recovered products be taken into account, but the increased value of the treated stock be given proper credit.

A fruitful source of waste in mills, usually given scant attention, is the loss of good soap due to hard water, where the use of inexpensive chemicals, or a proper purifying plant would remove the trouble, and pay good interest on the investment. Impure water is responsible for other kinds of waste besides soap. Dyestuffs and mordants are frequently nullified in their action or even materially weakened, due to the production of secondary products having neither mordanting nor dyeing properties.

WATER AND WATER TESTS.

BY LOUIS J. MATOS.

Not all textile plants employ chemists, and these, above all others, should endeavor to exercise some sort of control over their supply of water, for it is now a well recognized fact that contaminated water has a very marked influence upon the results of various processes and the general output of the mill.

Hard water is well known to be very costly when viewed from the point of soap consumption, and it will be needless to refer to it here, but there are other evils to be traced to this cause that are, as a rule, overlooked. Hard water—whether the "hardness" is due to calcium or magnesium—causes a very appreciable loss of dyestuff due to the formation of insoluble, though very fine precipitate of color, and which cannot be fixed upon the fibres, but which is responsible for some of the objections raised about "loose" colors, especially those of the direct dyeing group. The alizarines are also very seriously acted upon by calcium and magnesium, and to such an extent that the correction of hard water used for dyeing these colors is now done very exactly.

Iron as an impurity in water is not injurious to ordinary dyeing processes, but it should not be present in water used for bleaching.

The following simple tests may be made by any dyer who will provide himself with the few pure chemical test solutions necessary, and familiarize himself with their uses. They are:

Dilute Hydrochloric Acid.
Dilute Nitric Acid.
Ammonia Water.
Ammonic Oxalate.
Yellow Prussiate of Potash.
Phosphate of Soda.

The apparatus necessary for the few simple tests are a porcelain evaporating dish, 3 in. in diameter, a 1/2 doz. test-tubes, 2 or 3 glass rods, 6 in. long, and a small funnel with some filter paper.

To make the test for lime and magnesia. Evaporate a few ounces of the water to dryness in the dish, add 3 or 4 drops of the hydrochloric acid, dilute with pure distilled water, and add some ammonia and boil for a minute and filter. The portion that passes through the filter is treated with a few drops of ammonium oxalate, and if a white cloudiness is observed, it is due to lime. Let this solution stand for a few hours and filter. To the clear solution add some phosphate of soda, and if a precipitate is noticed in say 30 minutes, the presence of magnesia is assured.

Test for iron. Proceed exactly as for lime and magnesia, and save the filter paper and its contents after filtering the first ammonia solution. If any brownish coloration is no-

ticed iron is almost sure to be present, but to be positive, pour a few drops of the hydrochloric acid on the filter to dissolve the residue, wash it into a test-tube, add 1 drop of nitric acid, and a drop of the yellow prussiate of potash; a blue color is proof positive that iron is present. Or, the water sample can be evaporated to dryness in the dish, a drop of nitric acid added, then a little water, and finally a drop of the yellow prussiate solution —the blue color will be a sure sign of iron.

These tests are of considerable importance, and are those most frequently made in preliminary tests of water for mill uses.

In special cases, and in all instances of doubt, the trained chemist alone is qualified to make a complete examination of water, and such tests should be made when the water supply is supposed to be in doubt regarding quality.

After heavy rains, many water supplies are made practically useless for bleaching or dyeing, owing to the large quantities of suspended matter, consisting of very fine clay which remains in suspension for a long time. The only remedy for this trouble is ample storage and subsiding reservoirs or efficient filters. No chemical treatment will meet this case.

On the other hand, hard water and iron water may be purified by treating with various chemicals such as alum, tri-sodium phosphate, caustic soda used alone or in the presence of a nicely calculated quantity of lime water, but the use of these various chemicals requires suitable mechanical appliances in order that the yield of pure water shall be constant, and at the minimum of cost per each 1,000 gallon units.

Large and medium sized textile plants using water that carries lime or magnesia ought to inquire closely into the soap account on the one hand, and the fuel account on the other, as both of these are materially influenced by the alkaline earths, forming insoluble soaps in scouring, and non-conducting boiler scale on the other. The soap destroying power of one pound of lime in the form of carbonate as dissolved in water is equal to ten (10) pounds of soap, so that if a mill uses water of, say, 1 degree hardness, each 1,000 gallons cause a loss of nearly 1 1/2 lbs. of soap, so that the saving in soap alone for a large plant would more than pay for the cost of a complete purifying equipment. One degree of hardness is equal to 1 grain of calcium carbonate per gallon of water.

CORRECTION.

On page 158 of the June number, Recipe No. 86, Yellow on Worsted Yarn, Sykes & Street, should read 1 1/2 lbs. Chrome Acid instead of 1 1/2 lbs. of Acetic Acid as given.

New Color Cards.

Para Diamine Black B; Cessella Color Co., 182 Front St., New York City.

One sample of cotton piece goods, one of cotton yarn and one of polished yarn dyed with different percentages of Para Diamine Black B.

Immedial Bordeaux G; Cassella Color Co., 182 Front St., New York City.

One sample of cotton yarn and one of cotton piece goods dyed with Immedial Bordeaux G Conc., for which full instructions are given.

Amido Acid Black; Berlin Aniline Works, 213 Water St., New York City.

Six samples of woolen piece goods dyed with Amido Acid Black B, 4B and 6B. Three of the samples contain white checking threads which were not colored by the dye.

Anthra Cyanine; Farbenfabriken of Elberfeld Co., 40 Stone St., New York City.

Three samples of woolen piece goods colored with 4 per cent. dyeings of Anthra Cyanine DL, BL and FL.

Sulfur Black; Berlin Aniline Works, 213 Water St., New York City.

A card showing six samples of cotton yarn dyed with different percentages of the Sulfur Blacks.

Immedial Colors on Cotton Yarn; Cassella Color Co., 182 Front St., New York City.

A card showing thirty-two samples of cotton yarn dyed with the Immedial Shades of the Cassella Color Co.

Immedial Indone; Cassella Color Co., 182 Front St., New York City.

Eight samples of cotton yarn, two of loose cotton, four of cotton cloth and two of linen dyed blue with different percentages of Immedial Indone BBF Conc. and BF Conc.

Katigen Red Brown R; Fabenfabriken of Elberfeld Co., 40 Stone St., New York City.

Three samples of cotton yarn dyed with different percentages of Katigen Red Brown R.

DYE RECIPES.

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD RECORD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16-page pamphlet, in convenient form for preservation Subscription price for the Dyers' Supplement $1.00 per year

Recipe No. 97.

Yellow on Cotton Yarn.

Paranol Yellow R on 100 lbs. cotton yarn. Prepare the dye bath with

2 lbs. Paranol Yellow R.
(E. M. Thayer & Co., 106-112 Broad St., Boston.)
20 lbs. Common Salt.

Enter yarn at 170° F., bring to a boil and dye at a boil for one hour.

Paranol Yellow R, for a direct cotton color, possesses exceptional fastness to light and washing.

Recipe No. 98.

Black on Cotton Yarn.

Thiogene Black M Conc. on 100 lbs. cotton yarn. Prepare the dye bath as follows:

First bath:
9 lbs. Thiogene Black M Conc.
(H. A. Metz & Co., 122 Hudson St., New York.)
27 lbs. Sodium Sulphide Crystals.
9 lbs. Soda Ash (58% Alkali).
2 lbs. Caustic Soda (40° Be.).
40 lbs. Common Salt.
Second bath:
6.5 lbs. Thiogene Black M Conc.
(H. A. Metz & Co., 122 Hudson St., New York.)
13 lbs. Sodium Sulphide Crystals.
3 lbs. Soda Ash (58% Alkali).
1 lb. Caustic Soda (40° Be.).
15 lbs. Common Salt.
Third bath:
5 lbs. Thiogene Black M Conc.
(H. A. Metz & Co., 122 Hudson St., New York.)
10 lbs. Sodium Sulphide Crystals.
2 lbs. Soda Ash (58% Alkali).
1 lb. Caustic Soda (40° Be.).
3 lbs. Common Salt.

Enter yarn at 160° F. and dye at a temperature of 170° to 180° F., keeping material below the surface as much as possible.

In machine dyeing Glauber's Salt is recommended. For improving the shade of the finish 2 per cent. olive oil soap, 2 per cent. cocoanut oil and a small quantity of starch can be used.

Thiogene Black M Conc. is a double strength black which is dyed like the other thiogene colors, giving shades which are very fast to washing, fulling, light and boiling with soda and acid, but not very fast to chlorine bleach.

Recipe No. 99.

Blue on Cotton Yarn.

Immedial Indone B F Concentrated on 100 lbs. cotton yarn. Prepare the dye bath with

8 lbs. Immedial Indone B F Conc.
(Cassella Color Co., 182 Front St., New York.)
16 lbs. Sodium Sulphide Crystals.
6 lbs. Glucose.
3 lbs. Soda Ash.
10 lbs. Common Salt.

Enter at 120° F., dye for one hour at a temperature of from 120° to 130° F., then squeeze well, expose to the air in an open condition for ¾ of an hour, then rinse thoroughly and dry.

Immedial Indone B F Conc. is distinguished for its excellent fastness and its brilliant and pure shade.

Recipe No. 100.

Black on Worsted Yarn.

Naphtylamine Black 4 B on 100 lbs. worsted yarn. Prepare the dye bath with

5 lbs. Naphtylamine Black 4 B.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)
10 lbs. Glauber's Salt.
5 lbs. Acetic Acid.

Enter at 140° F., bring to a boil and dye at a boiling temperature for one hour.

Exhaust the dye bath by adding a little sulphuric acid or sodium bisulphate.

Naphtylamine Black 4 B approaches very closely the shade of logwood black. It is fast to rubbing, perspiration and carbonizing, dyes very level, penetrates well, and is superior to logwood black as regards fastness to light.

Recipe No. 101.

Black on Woolen Yarn.

Fast Chrome Black F on 100 lbs. woolen yarn. Prepare the dye bath with

5 lbs. Fast Chrome Black F, previously dissolved in boiling water.
(Read, Holliday & Sons, Ltd., 7 Platt St., New York.)
10 lbs. Glauber's Salt.
1½ lbs. Acetic Acid.

The wool is entered cold to lukewarm, and the bath gradually raised to a boil in three-quarters to one hour, boiling continued from one-half to one hour, according to the nature of the goods, when the dye bath should be exhausted. If this is not the case, add

½ to 1 lb. D O V

and boil one-quarter hour longer, then add

2 lbs. Bichrome

and boil from twenty minutes to one-half hour. The Bichrome should not be added before the bath is exhausted or else the shade will be liable to rub.

Fast Chrome Black F possesses remarkable fastness to light, alkali, acid and milling.

Recipe No. 102.

Reddish Brown on Cotton Yarn.

Immedial Bordeaux G Conc. on 100 lbs. cotton yarn. Prepare the dye bath with

8 lbs. Immedial Bordeaux G Conc.
(Cassella Color Co., 182 Front St., New York.)
8 lbs. Sodium Sulphide.
2 lbs. Glue.
3 lbs. Soda Ash.
50 lbs. Common Salt.

Enter yarn at 160° F. and dye at a temperature of between 160° and 170° F. for one hour.

Squeeze quickly, rinse thoroughly in cold water and then in hot water to which a little acetic acid has been added.

Immedial Bordeaux G Conc. is the nearest approach to a red of any of the sulphur colors now upon the market, and is especially fast to washing, light and acids. It is excellently adapted to the production of claret and reddish brown shades.

Recipe No. 103.

Black on Worsted Yarn.

Fast Acid Black 3 B on 100 lbs. worsted yarn. Prepare the dye bath with

5 lbs. Fast Acid Black 3 B.
(New York & Boston Dyewood Co., 156 William St., New York.)
5 lbs. Acetic Acid.

Add the acid gradually and after boiling ¾ of an hour, add

1 lb. Sulphuric Acid,

to exhaust the dye bath.

Fast Acid Black 3 B is strongly recommended where shades are required to stand milling, and is of special interest to raw stock and hosiery dyers.

Recipe No. 104.

Red on Cotton Yarn.

Toluylene Red on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Toluylene Red.
(Geisenheimer & Co., 189 Front St., New York.)
50 lbs. Glauber's Salt.

Boil up and enter the previously boiled out yarn and dye at a boil for one hour.

Toluylene Red, when used in low percentages, gives excellent shades of rose pink. It produces colors possessing excellent fastness to water and washing. It is very soluble in water and its fastness to acids is good.

Recipe No. 105.

Blue on Cotton Yarn.

Diazo Indigo Blue 4 R L on 100 lbs. cotton yarn. Prepare the dye bath with

3½ lbs. Diazo Indigo Blue 4 R L.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)
2 lbs. Soda Ash.
20 lbs. Common Salt.

Enter at 180° F. and dye at a boil for one hour, then diazotize by working for 15 minutes in a cold bath made up with

3 lbs. Sodium Nitrite,
10 lbs. Hydrochloric Acid,

and then develop in a cold bath containing

2 lbs. Beta Naphthol,

dissolved with a little caustic soda solution.

Diazo Indigo Blue 4 R L possesses excellent fastness to light, and is suitable for the dyeing of all classes of cotton goods.

Recipe No. 106.

Black on Wool and Cotton Mixed Yarn.

Amido Acid Black B on 100 lbs. cotton and wool yarn. Prepare the dye bath with

6 lbs. Amido Acid Black B.
(Berlin Aniline Works, 213-215 Water St., New York.)
20 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid.

Enter yarn at 100° F., raise slowly to a boil and dye at a boil for one hour.

Amido Acid Black B is particularly valuable in dyeing of woolen piece goods containing vegetable fibres when it is desired to leave the vegetable fibres, such as cotton, china grass, linen, artificial silk, etc., unstained.

Amido Acid Black B dissolves readily, dyes very evenly from an acid bath, and gives a bloomy shade which is not unfavorably influenced by artificial light. Its fastness to rubbing, steaming, ironing and light is good.

Recipe No. 107.

Black on Worsted Yarn.

Amido Acid Black 4 B on 100 lbs. worsted yarn. Prepare the dye bath with

7 lbs. Amido Acid Black 4 B.
(Berlin Aniline Works, 213-215 Water St., New York.)
20 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid.

Enter at 100° F., raise very slowly to a boil and dye at a boil for one hour.

Amido Acid Black 4 B, like Amido Acid Black B (see Dye Sample No. 106), is particularly valuable in the dyeing of woolen piece goods, where it is desired to leave the vegetable fibres, such as cotton, china grass, linen, artificial silk, etc., unstained.

Amido Acid Black 4 B dissolves readily, dyes evenly from an acid bath and gives a bloomy shade, which is not unfavorably influenced by artificial light. Its fastness to rubbing, steaming, ironing and light is good.

Recipe No. 108.

Scarlet on Woolen Cloth.

Fast Acid Scarlet B E E on 100 lbs. woolen cloth. Prepare the dye bath with

2 lbs. Fast Acid Scarlet B E E.
(Sykes & Street, 85 Water St., New York.)
3 lbs. Sulphuric Acid.
10 lbs. Glauber's Salt.

Enter at 140° F., bring to a boil and dye at a boiling temperature for one hour.

Fast Acid Scarlet B E E gives shades of a full, rich bluish tone, and can be used in combination with chrome and alizarine colors.

Recipe No. 109.

Green on Worsted Yarn.

Domingo Chrome Green W on 100 lbs. worsted yarn. Prepare the dye bath with

3½ lbs. Domingo Chrome Green W.
(C. Bischoff & Co., 88 Park Pl., New York.)
20 lbs. Glauber's Salt.
5 lbs. Acetic Acid.

Enter at 100° F., bring gradually to a boil and dye at a boiling temperature for one hour, gradually adding

3 lbs. Sulphuric Acid,

then after treat at the boil for ¾ of an hour in the same bath to which has been added

2 lbs. Potassium Bichromate.

Domingo Chrome Green W gives an excellent shade of fast green on all kinds of woolen material.

Recipe No. 110.

Black on Worsted Yarn.

Naphtylamine Black 4 B K on 100 lbs. worsted yarn. Prepare the dye bath with

5 lbs. Naphtylamine Black 4 B K.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)
10 lbs. Glauber's Salt.
5 lbs. Acetic Acid.

Enter at 140° F., bring to a boil and dye at a boiling temperature for one hour.

Exhaust the dye bath by adding a little sulphuric acid or sodium bisulphate.

Naphtylamine Black 4 B K approaches very closely the shade of logwood black. It is fast to rubbing, perspiration and carbonizing, dyes very level, penetrates well and is superior to logwood black as regards fastness to light.

Recipe No. 111.

Blue on Worsted Yarn.

Alizarine Blue 3 R on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Alizarine Blue 3 R.
(Thomas Leyland & Co., 53 India St., Boston.)
10 lbs. Glauber's Salt.

Enter at 120° F. and dye for one hour just below the boil, taking great care that the bath is heated gradually. If necessary clear the bath towards the end of the dyeing by adding

3 lbs. Acetic Acid.

Alizarine Blue 3 R is fast to light and milling and will be found very useful for the production of bright and full navy blues on all classes of woolen material.

Recipe No. 112.

Black on Worsted Yarn.

Amido Acid Black 6 B on 100 lbs. worsted yarn. Prepare the dye bath with

7 lbs. Amido Acid Black 6 B.
(Berlin Aniline Works, 213-215 Water St., New York.)
20 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid.

Enter at 100° F., raise very slowly to a boil and dye at a boil for one hour.

Amido Acid Black 6 B, like Amido Acid Black B (see dyed sample No. 106), is particularly valuable in the dyeing of woolen piece goods where it is desired to leave the vegetable fibres, such as cotton, china grass, linen, artificial silk, etc., unstained.

Amido Acid Black 6 B dissolves readily, dyes evenly from an acid bath and gives a bloomy shade, which is not unfavorably influenced by artificial light. Its fastness to rubbing, steaming, ironing and light is good.

Mill News.

COTTON.

New Mills.

*Maryland, Baltimore. The new cotton mill to be built here will be operated under name of William P. Hooper Sons Company. Contract for machinery has been let to the Lowell Machine Shop, Lowell, Mass. This will be a 10,000 spindle mill.

*Missouri, Carthage. The Carthage Cotton Mills Company will start construction of new mill in about 30 days. This company has an authorized capital of $600,000, of which $212,500 is paid in. Witten McDonald is president of the company and J. L. Moore, treasurer. Will equip mill with 10,000 spindles and 300 looms.

*North Carolina, Fayetteville. The Lakeview Manufacturing Company has been incorporated with capital stock of $50,000, with W. L. Holt, president and treasurer. They will manufacture yarns, 8s to 20s, warps and skeins, cones and tubes, operating 5,000 spindles. The plant formerly operated by the Fayetteville Cotton Mills has been purchased. A new addition is being built and new machinery being installed. Will start operations about Sept. 1st.

North Carolina, Roaring River. The Damask Manufacturing Company has been incorporated by Ira R. Hayes, R. W. S. Pegram and W. L. Harper, with capital stock of $20,000.

*North Carolina, Shelby. The Lily Mill & Power Company has started work on construction of their new mill building, which will be 256 by 80 feet, one and one-half stories. They will install the latest improved machinery, contract for which has been awarded the Lowell Machine Shop. Combed yarn will be made. Expect to have the plant in operation this fall.

Pennsylvania, Sellersville. Plans are being prepared for a new plant to be erected for the Armine Tapestry Mills Co. The building will be brick, two stories. A. Mitchell, 2739 Fairhill St., Philadelphia, is in charge.

Rhode Island, North Smithfield. Machinery is constantly arriving for the Blackstone Manufacturing Company's plant. It is thought that they may be in operation by August 15th.

Rhode Island, Woonsocket. A new building, 30 by 40 feet, one story, is to be built for Fred B. Wilkins, for purpose of manufacturing plain and fancy tapes.

*Texas, Dallas. The Electric Cotton Mills have been incorporated with capital stock of $1,000,000 to operate mills at Paris and Mabank. Among the incorporators are W. I. Young (Greensboro, N. C.), J. E. Shirrine (Greenville, S. C.) and C. C. Muller (Dallas).

*Texas, Mabank. The main building of the new plant to be established here will be 325 by 105 feet, two stories.

Enlargements and Improvements.

*Alabama, Girard. The Girard Cotton Mills have awarded contract for the additional machinery (600 spindles and 15 looms) to be installed.

Alabama, Huntsville. The Lowe Manufacturing Company is reported as having plans drawn for an addition to the mill.

Alabama, Sylacauga. The Central Cotton Mills at this place have been secured by the Avondale Cotton Mills, of Birmingham, which will continue operating the plant at this place.

Connecticut, Danielson. About July 1st the Danielson Cotton Company will install twenty new revolving flat cards in the mill.

*Connecticut, New London. The Palmer Bros. Co. have purchased the R. T. Palmer Company's mill at this place.

Georgia, Aragon. A few additional looms are to be installed in the Aragon Mills.

*Georgia, Athens. R. L. Moss & Co., who purchased the Athens Manufacturing Co.'s plant, will remodel the entire plant. An additional building will be erected and 10,000 ring spindles installed, also some old machinery replaced with new. It is proposed to add looms after mill is under way.

Kentucky, Maysville. Extensive improvements are contemplated by the Maysville Cotton Mills, including installation of considerable new machinery.

Massachusetts, Lowell. Contract has been awarded for the erection of a new six-story mill, corner Jackson and Hamilton Sts., for the Appleton Co. The napping and cloth rooms, now somewhat crowded in the old plant, will occupy two floors of the new building. The other floors will be used for storage purposes.

Massachusetts, North Oxford. The Bartlett Mill at this place has been shut down for a week. They will install 1,200 new spindles in the plant and make repairs to the floors, etc.

*Massachusetts, Westboro. The Westboro Weaving Company, manufacturing non-elastic fabrics, has increased the capital stock for purpose of enlarging the plant.

New York, Valatie. The Harder Manufacturing Company has recently increased the capital stock from $100,000 to $175,000.

*North Carolina, Fayetteville. Work has been started on enlargement to the Holt-Williamson Manufacturing Company's plant. They will install 4,784 new spindles (ordered).

*North Carolina, Gastonia. The Loray Mills are installing machinery, doubling the present capacity of the plant.

*North Carolina, Henderson. The Harriet Cotton Mills, reported building an addition to the mill, will install more spindles in the plant.

North Carolina, King's Mountain. The Cora Mills have recently completed installation of 5,000 spindles and 2,400 twisters.

North Carolina, King's Mountain. The King's Mountain Mfg. Co. has replaced their small cards with 12 forty inch ones from the Lowell Machine Shop. They have also added a new Kitson machine.

*North Carolina, Roanoke Rapids. The Roanoke Mills have placed a large order for humidifiers with the American Moistening Company, Boston, Mass.

North Carolina, Worth. The Harden Mfg. Co. have recently completed an addition, 128 by 50 feet, 2 stories, to the mill. They installed 2,080 new spindles in the plant and one new twister.

Pennsylvania, Chester. Welsh & Dick have received additional machinery which is to be installed at once. This concern manufactures Turkish towels.

Pennsylvania, Wilkesbarre. The Wilkesbarre Lace Mfg. Co. contemplates enlarging the plant.

*South Carolina, Greer's. Work is progressing rapidly on the addition to the Victor Manufacturing Company's plant. The main addition will be 130 by 430 feet, four stories, and as previously reported, will be equipped with 25,000 spindles and 700 looms.

South Carolina, Lolo. The Valley Falls Manufacturing Company has awarded contract for installation of additional machinery (5,000 spindles and 150 looms) to be added.

*South Carolina, Rock Hill. A meeting of the stockholders of the Arcade Cotton Mills will be held June 21st, to consider increasing capital stock $30,000, for purpose of installing additional machinery (about 6,000 spindles) and making other improvements.

South Carolina, Union. The Buffalo Cotton Mills have placed their order with the American Moistening Company for the equipment of their carding room with humidifiers.

*Tennessee, Chattanooga. The Richmond Spinning Company advises us that nothing further has been done than increasing the capital stock for purpose of erecting a hosiery mill and the matter still stands in that shape.

Mills Starting Up.

*Georgia, Rome. Operations will start about July 15th in the Floyd Cotton Mills, which are located in the plant formerly known as the Rome Cotton Mills. The entire plant has been overhauled and new machinery installed.

Massachusetts. Boston. John C. Meyer & Co. advise us that they are about to start their factory, corner Bismark and Boylston Streets, Jamaica Plain, manufacturing spool cottons as well as silks of all kinds. They will do their own dyeing and bleaching at the mill. Building is four stories high, equipped with the latest improved machinery. Will occupy about 50,000 square feet.

Massachusetts, Fall River. All departments of the Chace Mills, Nos. 1 and 2, have been started up in full.

*Massachusetts, South Hadley Falls. The Hadley Mills have resumed operations after shut down of one week, owing to orders. It was at first proposed to close the plant for two weeks, while installing new machinery.

*South Carolina, Lando. Operations have been resumed by the Manetta Mills. The plant was recently damaged by fire but not as seriously as was reported.

Mills Shutting Down.

Canada, Montreal. The various mills of the Canadian Cotton Company will be closed the first two weeks in July. There is some probability that some of the mills will remain closed longer.

Connecticut, Jewett City. The Ashland Cotton Company's mills have been closed for an indefinite time.

Indiana, Evansville. The Evansville Cotton Mills have been closed indefinitely for purpose of curtailing production.

Maine, Augusta. The Edwards Cotton Manufacturing Company will close the mill July 16th for two months.

Massachusetts, Franklin. The Worcester Textile Co.'s mill at Unionville has been shut down for an indefinite time.

Massachusetts, Lawrence. The Pemberton Mills will shut down Saturday for two months. The Methuen Mills, at Methuen, will also close for the same period.

Massachusetts, Waltham. The Boston Mfg. Co. will close the mill July 2d. Operations will be resumed on July 18th.

New Hampshire, Exeter. The Exeter Manufacturing Company has closed the mill for one week.

WOOLEN.

New Mills.

*Georgia, Marietta. The Standard Press Cloth Company has been incorporated with capital stock of $100,000, with M. M. Sessions, president; Thos. S. Keenan, secretary, and A. F. Parker, superintendent. They propose manufacturing camel's hair and mohair press cloth, also yarns. Work will start at once on erecting new building, etc. This project was mentioned last December, but there has been some delay in getting the organization complete.

*Massachusetts, East Douglass. W. E. Hayward is president of the Schuster Woolen Mills, recently incorporated with capital stock of $200,000, and W. S. Schuster, treasurer. A new building will be erected, which will include a dye house. Will use steam and water power. About 250 people will be employed.

*Montana, Great Falls. Sam. H. Wood of the Manchester Woolen Company is negotiating for the purchase of machinery for the mill, as that which was intended for the plant, from Manchester, Iowa, has been destroyed by fire.

*Rhode Island, Providence. Work on the Jos. Benn & Sons, Inc., new mill at Greystone is fast

progressing. The old mill will be utilized for a lighting station. A 50 H. P. motor will be installed to furnish 500 lamps. Main mill will be 5 stories, 436 by 62, the weave shed, one story, with saw teeth roof 308 by 156. Fifty cottages will be built of two tenements each. The mill will be built and operated on the English plan. No domestic material will be used in the manufacture of the goods. The mill shafting will be driven by four induction motors placed in different rooms.

*Rhode Island, Woonsocket. Work will soon start upon construction of new plant for the Alsace Worsted Company. A building 230 by 160 feet, one story, has been planned, with saw tooth roof.

Enlargements and Improvements.

Connecticut, Somersville. A new boiler and engine is to be installed in the Somersville Woolen Manufacturing Co.'s plant, for purpose of providing additional power. A new smokestack, 125 feet high, will also be built.

Maryland, Baltimore. Schultz & Bro., carpet manufacturers, have purchased a site upon which they contemplate erecting a new brick factory.

Massachusetts, Franklin. The Ray Fabric Mills are operating their plant with a night and day force. Two new sets of cards will be installed. They have also started work on erection of a new storehouse, 96 by 40 feet.

Massachusetts, Franklin. Operations have been resumed in the Singleton Worsted Co.'s mill, after shut down of about one week, during which time two new boilers were installed.

Massachusetts, Millbury. The Mayo Woolen Company has purchased the mill property known as the Pinafore Mill. As soon as the machinery can be installed part of the plant will be utilized for a picker house. Later they contemplate putting in machinery for manufacturing yarn.

Massachusetts, Watertown. The Aetna Mills are to be shut down for three weeks for purpose of installing a new Corliss engine.

Massachusetts, Webster. The Intervale Mills are increasing their capacity to 16 sets and 96 looms, filling their new addition.

Massachusetts, Webster. The Merritt Woolen Co. is putting in a spinning frame.

New Hampshire, Franklin Falls. The Walter Aikens Sons' mill has been purchased by the M. T. Stevens & Sons Co., which will operate same in connection with their Franklin Mill.

New Hampshire, Hinsdale. Haile & Frost Mfg. Co. have recently completed installation of additional machinery and two new 125 H. P. steam boilers. They are also putting up a warp-dressing machine.

New Jersey, Passaic. The Brighton Mills are equipping their mill with the American Moistening Company's system of humidifiers.

New Jersey, Passaic. The Botany Worsted Mills have placed an order with the American Moistening Company, Boston, Mass., for humidifiers.

New Jersey, Passaic. The Botany Worsted Mills have recently completed installation of 12 new looms in the plant.

New York, Frankfort. The Mohawk Valley Woolen Company is having an addition built for purpose of accommodating the increasing business.

*New York, Little Falls. The Adirondack Woolen Company is raising the mill building one story, making it four stories; building a new elevator shaft and purchased a new hydraulic elevator. They are also adding new picking machinery and other equipment.

North Carolina, Spray. An addition, 200 feet long, one story, will be built by the Spray Woolen Mills, to be used for inspection, shipping and office departments.

Ontario, Bolton. The Bolton Woolen Mill, of which J. Walshaw is the proprietor, is being rebuilt. The factory, before its destruction by fire in April of 1903, operated 3 sets of cards and 13 looms on blankets, doing their own dyeing, being run by both steam and water.

Pennsylvania, Philadelphia. The Roosevelt Worsted Mills, 2025 Naudain Street, will in a short time greatly enlarge their establishment by taking over two more floors of the building in which they are now located. This additional space will be filled with new carding, combing and twisting machinery for the manufacture of worsted yarns, giving them a production of 17,000 pounds of yarn a week. The machinery has not yet been ordered.

Pennsylvania, Philadelphia. The Manningham Worsted Mills, at Germantown, are installing additional set of cards and other machinery.

Pennsylvania, Philadelphia. A. J. Cameron & Co. have adopted the American Moistening Company's system of humidifiers.

Pennsylvania, Philadelphia. The alterations and additions to the scouring department of Thomas Wolstenholme Sons & Co.'s mill at Frankford Ave. and Westmoreland Streets will cost, it is said, about $13,500. The contract has been given out and the work will be pushed forward to completion.

Pennsylvania, Philadelphia. Messrs. Eavenson & Levering, scourers, burrers and carbonizers of wool on Naudain St., will remove their establishment to Camden, N. J., where they are about to have erected new buildings which will consist of a one and two story factory, 291.4 by 99 feet, with a boiler and engine house, 68 by 40 feet. The plant will be located at the intersection of the Reading R. R. and Atlantic Avenue.

Pennsylvania, Reading. An addition, for which contract has been let, is to be built to A. J. Brumbach's woolen mills. The annex will be 50 by 26 feet. The office will also be remodelled.

Rhode Island, Bristol. An addition is being built to the Cranston Worsted Mills. The office building is also being raised one and a half stories.

Rhode Island, Glendale. The Glendale Woolen Mill has completed an addition, 54 by 75 feet. Three sets of cards and two mules are being installed.

*Rhode Island, Olneyville. Plans have been prepared for the new buildings to be erected by the Centredale Worsted Mills, on site recently purchased. The main building will be 251 by 67 feet, with an ell 152 by 70 feet, three stories high. Part of the building will be used for storage and part for sorting and scouring wool. Later the carding and combing departments will be added.

Rhode Island, Pascoag. The Anchor Mills have recently replaced 70 of the Crompton looms with 65 Knowles looms.

Tennessee, Jefferson City. An addition is to be built to the Jefferson City Woolen Mills.

Vermont, Winooski. The Winooski Mill of the American Woolen Co. has recently completed installation of an additional finishing department, comprising ten (Hunter) fulling mills, four washers, extractor, dryer and two shears.

Virginia, Fredericksburg. A new stock house has recently been built for the Melville Woolen Company. They have also put in additional spindles.

Mills Starting Up.

Connecticut, Montville. The Cochegan Woolen Co.'s mill, in hands of Nathan Brewster, trustee in bankruptcy, has been sold and will soon be put in operation by new parties. William D. Hawkins, of Norwich, will be superintendent under new regime.

Manitoba, St. Boniface. The Ryan & Goodland Co.'s mill which has been shut down for some little time, has resumed operations.

Massachusetts, Spencer. The Taylor Woolen Company is to be reorganized. New York parties are to be interested in the plant with Mr. Taylor. The mills have been closed for the past two weeks, but will resume operations on Monday.

Massachusetts, Uxbridge. Operations have been resumed in the Calumet Woolen Co.'s mill.

*Pennsylvania, Aston Mills. The May Manufacturing Company, which shut down a short time ago, has started work in the dyehouse and some departments, and it is expected will soon be running on full time.

*West Virginia, Barnesville. Operations have been resumed in the Barnesville Manufacturing Company's plant after shut down of short time.

Mills Shutting Down.

Maine, North Dexter. The mill at this place has been shut down for an indefinite time.

Maryland, Baltimore. The mill of the Maryland Woolen Company, recently reported placed in hands of receiver and operating under management of Otto Scharegge, has been shut down.

Massachusetts, Amesbury. One of the Hamilton Woolen Company's mills has been shut down.

Massachusetts, Lowell. The Middlesex Woolen Mills will close Friday night for several weeks. During idleness a number of necessary repairs will be made to the plant.

New York, West Eaton. The Fraserdale Woolen Mills have been closed temporarily owing to trade conditions.

KNIT.

For Knitting Mill News, see Knitting Department.

SILK.

New Mills.

Maryland, Baltimore. The Southern Embroidery Company, Andrew G. Steelman, proprietor, will build a plant here. The building will be 220 by 25 feet, three stories high and will be equipped with modern machinery.

Maryland, Hagerstown. D. F. Snyder, who has recently disposed of his interest in the Hagerstown Silk Company, contemplates starting plant for manufacturing silk ribbons.

*Pennsylvania, Chambersburg. Contract has been let for erection of the new silk mill building, which will be 123 by 44 feet, brick.

*Pennsylvania, Mercer. Operations will be started the latter part of July in the Mercer Silk Company's new plant. R. R. Wright is president of the company; A. B. Carter, secretary; Herman Frankel, treasurer, and David L. Newton, superintendent.

Enlargements and Improvements.

Connecticut, South Manchester. A new office building, 120 by 40 feet, two stories, brick, will be erected for Cheney Bros.

Pennsylvania, Lansdowne. The General Artificial Silk Company, which recently completed addition to the plant, has started work on another addition. A new engine house is also under construction.

Mills Starting Up.

*Connecticut, Montville. A recent report states that O. S. Chaffee's silk mill, which has been closed, is to be put in operation again.

*New York, Fort Hunter. Operations have been resumed by the Nottingham Fabric Company in the Dexter Silk Mill.

Pennsylvania, Philadelphia. The Pine Tree Silk Mills Company has placed its order for humidifiers with the American Moistening Company, Boston, Mass.

Mills Shutting Down.

*Pennsylvania, Kutztown. The Kutztown Silk Throwing Mill and machinery is to be sold. A weaving plant will be installed in the building.

Pennsylvania, New Holland. The New Holland Silk Mill, operated by James H. Rodgers, of Paterson, N. J., has been closed. It is thought that the plant will remain closed permanently.

MISCELLANEOUS.

New Mills.

Illinois, Rockford. Gus J. Peter will rebuild his dyeing establishment recently destroyed by fire. The new building will be two stories with a one story wing in the rear, and will be equipped with all modern machinery.

New Hampshire, Meredith. The Atlas Linen Company will make an enlargement to the plant soon. New carding and spinning machinery will be put in.

New York, Binghamton. A new plant will be established here by the Binghamton Linen Company. About 100 people will be employed.

New York, Brooklyn. It is reported that Armstrong, Walls & Co., 82-84 Centre Street, New York City, are equipping a plant here for manufacturing jute yarns and burlap bagging. Robert B. Brown is in charge.

Northwest Territory. Edmonton. George E. Dickson, of this place, is reported as interested in establishing a linen mill here and has gone abroad for purpose of purchasing machinery.

*Pennsylvania, Philadelphia. The Oxford Mills Company has been incorporated to operate the plant formerly run by the Quaker City Dye Works, at Front and Oxford Streets. This plant was recently reported as having been purchased by Thos. Henry & Son, on speculation.

Pennsylvania, Philadelphia. John R. Mawson, of the John Mawson Hair Cloth Co., has bought out the entire business and equipment of the Dewey-White Bleachery Co., 2539 Potter Street. and in the future will run it under the name of the Diamond Bleaching Co. In this new acquisition the warps of the Mawson Co. will be bleached and at the same time a general bleaching and finishing of cotton goods, yarns, webbing, plushes, tapes, etc., will be done for the trade.

Enlargements and Improvements.

Pennsylvania, Philadelphia. Plans are being prepared for an addition to be made to the Hulton Dyeing & Finishing Co.'s plant, 2712 Jasper Street.

FAILURES AND SUSPENSIONS.

Delaware, Wilmington. It is reported that a petition has been filed by the Franklinville Dye Works and other concerns asking that the Smyrna Shirt & Hosiery Co. be declared bankrupt.

*Maryland, Baltimore. A petition has been filed by H. L. Cooper and James Barker of Philadelphia, and James H. Billington & Co., asking that the Maryland Woolen Company be adjudged bankrupt.

New Jersey, Paterson. Justice Cohen has been appointed receiver of the Riverside Silk Company, manufacturing broad silks. The liabilities are placed at about $12,000, with assets of about $13,500.

New Jersey, Peterson. Application for a receiver for the Passaic Falls Ribbon Co. has been made by Arthur Cliffe and Josiah Wells, who also asked that the company be declared insolvent. The company is reported not in operation and the business disorganized.

Oregon, Eugene. The creditors of the Willamette Valley Woolen Mfg. Co. have filed a petition asking that the company be declared bankrupt.

Pennsylvania, Philadelphia. James Hilton & Co., manufacturers of shoddy, have been petitioned into volutary bankruptcy. Their mill recently burned, and has just been rebuilt. It has been reported that Mr. Hilton collected a large amount of the insurance monev and departed for a trip abroad.

Pennsylvania, Slatington. The Slatington Textile Company's plant has been placed in the hands of a receiver, viz: D. G. Dery, of Catasauqua.

FIRES.

Iowa, Manchester. The Manchester Woolen Mills, J. S. Jones, proprietor, three sets and about twelve looms, have been burned.

New Jersey, Paterson. A recent fire at this place destroyed a number of silk plants, including I. A. Hall & Co.'s mill, Henry Doherty, Olympic Velvet Co., Paterson Silk Throwing Co. and Best & Sheldon, located in the Hall Mill. The loss is estimated at $125,000.

Virginia, Winchester. The Virginia Woolen Mills have been totally destroyed by fire. The loss is placed at $80,000, with insurance of $50,000.

FACTS AND GOSSIP.

Alabama, Birmingham. P. B. Thomas is interested in erecting a new building, four stories, for purpose of manufacturing various kinds of rugs.

Alabama, Huntsville. The Lowe Manufacturing Company has ordered additional humidifiers from the American Moistening Company, Boston, Mass.

*Connecticut, Stafford Springs. The receivership of the Staffordville Woolen Company has been terminated. A final report, which has been presented to the Court by E. C. Pinney, the receiver, has been approved and an order issued for payment of claims, discharging the receiver and dissolving the corporation. The mill is now operated by the Garland Woolen Company.

Connecticut, Willimantic. The American Thread Company's plant has started this week running but four days a week.

*Georgia, Barnesville. The Barnesville Manufacturing Company's plant has been sold to the bondholders for $50,000. It is thought that they will probably organize a new company and sell the plant to it.

Georgia, Bremen. M. L. Brown is reported as considering erection of a knitting mill and is investigating prices on machinery, etc.

Georgia, Columbus. The Progressive Union of this place is endeavoring to secure another cotton mill here, and it is reported that $50,000 is offered for purpose provided a like amount be subscribed by outsiders.

Georgia, Lagrange. The Dixie Mills have adopted the American Moistening Company's system of humidifiers.

*Georgia, Raccoon Mills. The Raccoon Cotton Mills, which have been in the hands of a receiver for some time, have been sold to John D. Cleghorn, of Summerville, for $50,625.

Personals.

Cotton.

James Cahill, overseer of carding for several years for Irvin C. Kerkeslager, spinner of carpet yarns at Manayunk, Pa., has resigned to accept a similar position with the Wabash Mills Co., at that place. Thomas Ambler has succeeded him as overseer of carding at the mill of Mr. Kerkeslager.

Joseph Hallows, for the past 20 years in the employ of the Globe Yarn Mills, Fall River, Mass., and for a number of years in charge of the ring spinning department of the No. 2 mill, has been selected as superintendent of mills Nos. 1 and 2, the position recently held by the late Supt. Miles.

Arthur R. Dickson, assistant superintendent of the Merchants' Manufacturing Company, Fall River, Mass., has been appointed superintendent of the Fall River Manufacturing Company.

J. S. Thomas has resigned as superintendent of the Union, S. C., cotton mills. Mr. Touchstone, superintendent of the Buffalo Cotton Mills at Union, will be in charge as superintendent of both mills.

Gilbert P. Cuttle has resigned as superintendent of the Pocasset Mfg. Co., Fall River, Mass. Mr. Cuttle has been with this company for a year and a half, and was formerly with the Border City Mfg. Co.

Alexander H. Downs closed his labors as an overseer in the Amory Corporation, Manchester, N. H., recently. He is succeeded by his son, Wilbur Downs, who for some years has filled the position of secondhand under his father.

George W. Stearns has resigned as overseer of cloth room at the Arcade Mills, Rock Hill, S. C.

George B. True, overseer of dyeing at the Manchester (N. H.) Mills, has resigned. William Gannon, secondhand, succeeds him.

Antoine Roy, North Adams, Mass., has gone to Utica, N. Y., to accept position of overseer of carding at the Skenandoa Cotton Co. He was formerly second hand of carding at the Eclipse Mill, and the help presented him with a gold ring on his leaving.

Ernest Hall, Riverside, Morris Co., N. J., has resigned as foreman of the German Artistic Weaving Co., and accepted the position of superintendent of the Victory Webbing Co., North Abington, Mass.

H. V. Martin has succeeded A. F. McBrinn as overseer of spinning at the Elizabeth Poole Mills, Taunton, Mass.

Henry S. Houghton, Jr., has resigned as superintendent of the Paul Whitin Mfg. Co., Northbridge, Mass., and has accepted a position as general superintendent of the mills of the Merchant Cotton Co. at Montreal, Canada.

William E. Howarth, superintendent of the Parker Mills, Warren, R. I., has been succeeded by Overseer Lee of the spinning room.

Calvin Sweet, for many years boss spinner at the Uncasville (Conn.) Mfg. Co., has been promoted to the position of assistant superintendent.

Woolen.

J. S. Barnett has been engaged as overseer of carding by Folwell Bro. & Co., Philadelphia. Mr. Barnett was in charge of this department before for this company for a number of years.

T. J. Sheehan, assistant superintendent at the Alling Knitting Mills, Derby, Conn., has resigned, and now is boss carder for the Madison Woolen Mill, Madison, Me.

Joseph Carroll, formerly on the road for Charles Bond, dealer in mill supplies of Philadelphia, is now head overseer of drawing in the Highland Worsted Mills, Camden, N. J.

Joseph Wagner succeeds Stephen Conway as overseer of carding for W. A. Bruch & Co., Philadelphia, spinners of gray carpet yarns. Mr. Wagner was recently employed by William Ayres & Sons in a similar capacity.

Robert Paris has taken charge of finishing at the St. Mary's Woolen Mfg. Co., St. Mary's O.

Henry C. Taylor has again entered the employ of the Faatz-Reynolds Felting Co., Lestershire, N. Y., as overseer of carding.

Thomas J. Sexton has resigned as overseer of carding at the Raritan Woolen Mills, Raritan, N. J.

Samuel McIntyre, formerly overseer of carding for the Hanover (Ill.) Woolen Mfg. Co., is now employed in a similar capacity by the Globe Woolen Co., Utica, N. Y.

James Hardy, late overseer of carding at the Norwalk Mills Co., Winnipauk, Conn., has accepted a similar position with the Moosup Mills of the American Woolen Co., Moosup, Conn.

Harley Beaumont, for the past four years employed in the Springville Mfg. Co., Rockville, Conn., is now assistant superintendent and designer at the Springfield Woolen Mills, Springfield, Ill.

Charles Robinson, designer at the National and Providence Worsted Mills, Providence, R. I., has resigned, to accept a position with the Earncliffe Worsted Mills, Olneyville, R. I.

D. S. Knight, boss weaver at the Bound Brook Woolen Mill, Bound Brook, N. J., has resigned.

John Boyle, of Lawrence, succeeds G. W. Tracy as overseer of spinning at Sutton's Mills, North Andover, Mass. Mr. Tracy goes to the Burlington Mill, Winooski, Vt.

William T. Kerwin has resigned as superintendent of the Atlantic Mills, Providence, R. I.

John T. McCormack, overseer of carding at Madison, Me., Woolen Company, has resigned to return to his former position with Robert Bleakie & Co., Hyde Park, Mass.

Sam Driver has accepted the position of carder with J. Broadbent & Sons, Unionville, Conn.

W. S. Morrow is carder at Saxton's River Woolen Mill, Saxton's River, Vt.

F. H. F. Ballou, at one time well known in Lawrence, Mass., is to be superintendent of the New Boston, Conn., mill.

Charles W. Burwood has resigned as overseer of spinning at the Glen Woolen Mills, Norwich, Conn., to go to the same position for the Medlicott Company, Windsor Locks, Conn.

William Lowe has resigned as overseer of carding at the Moosup (Conn.) Mills of the American Woolen Co.

Charles Roy has been appointed superintendent of the Watervleit (N. Y.) Mills of James Roy & Co., to succeed John McLaren.

T. J. Firth has been appointed superintendent of the Nye & Wait Carpet Co., Auburn, N. Y.

Deaths.

Channing Clapp, a retired cotton manufacturer, died at Boston, Mass. He began business as a cotton buyer in New Orleans, La., and later he returned to New England and became connected with the Amoskeag Mfg. Co., Manchester, N. H., serving as assistant treasurer. He retired from active service in 1888, when he suffered a stroke of apoplexy.

George W. Miles, superintendent of the Globe Yarn Mills, Fall River, Mass., died at his summer home in Tiverton, R. I. Mr. Miles went to Fall River a few years ago from New Bedford to take charge of these mills after they had passed into the control of the New England Cotton Yarn Company.

Abraham Gould Jennings, Brooklyn, N. Y., died June 3rd, at the age of eighty-three years. He was treasurer and director of the John Good-Jennings Patent Machine Cordage Company, and a director of the Silk Association of America.

John Ward, treasurer of the Standard Bleachery Company, Carlton Hill, N. J., died recently. He had been connected with the business for nineteen years.

D. F. Cannon, president of the Cannon Mfg. Co., and the Cabarrus Cotton Mill, both of Concord, N. C., died May 23rd. The deceased was born in 1844, and leaves a widow and four children.

Maj. John R. Loudon, a prominent man of Rock Hill, S. C., died at his home there on June 2. He was president of the Victoria Cotton Mills.

John Kilburn, the well-known cotton manufacturer, died at his home in Belmont, Mass., June 11th. The deceased was born in Walpole, N. H., in 1830. Mr. Kilburn learned the business of cotton manufacturing from his father, a manufacturer of Lonsdale, R. I. His first position as agent was held in 1859 in a cotton mill in Providence, R. I. In 1863 he was appointed agent of the Naumkeag Steam Mills, of Salem, Mass., where he remained till 1878. In that year he was appointed agent of the Lawrence Manufacturing Co. of Lowell. He remained with that important concern till 1893, when he retired from business and took up his residence in Belmont. Since that date, although not actively engaged in manufacturing, he had acted as a machinery expert, his advice often having been sought in the construction of mills in both the North and the South. Mr. Kilburn was a member of the Belmont Club, a director of the Kitson Machine Co., Lowell, and an officer in several other enterprises.

John Mulqueen, a pioneer manufacturer of carpets, died in Brooklyn, N. Y., recently. He was born in Limerick, Ireland, 73 years ago. In 1859 he became engaged in business on his own account. About 40 years ago he moved to Brooklyn and opened an establishment on Myrtle Avenue, where he had been located continuously up to the time of his death. The deceased leaves a widow, four sons and two daughters.

James Dawson died at his home in Canterbury, Conn., of a stroke of apoplexy June 15, in the 72d year of his age. He was born at Yarmouth, England, and came to America when about 26 years old. By occupation Mr. Dawson when young was an expert dyer of linen, wool and silk. Later on he became engaged in the manufacture of crinoline and rubber substitutes. He was the owner of a large factory in Brooklyn, and when he moved to Canterbury, about five years ago, he built another factory at that place.

Fowler L. Thurston, superintendent of the knitting department of the Virginia Woolen Mills, Winchester, Va., which were almost totally destroyed by fire June 15th, at the height of the blaze, died from excitement.

George Smith, a well known cotton manufacturer in New England, died in Pawtucket, R. I., recently. Mr. Smith retired from the superintendency of the Valley Falls Mills, Woonsocket, after a service of 47 years as superintendent, this being at intervals, having at certain periods been employed for himself and others. He was in all employed in cotton mills for about 73 years, 47 of which he was superintendent.

John T. Capps, secretary-treasurer and manager of the Springfield Woolen Mills, Springfield, Ill., died recently. Mr. Capps was one of the foremost business men in Springfield, and he has been identified with many of the improvements of the city during his long residence there. He entered the employ of the woolen mills at this place as bookkeeper and steadily rose to be manager.

Edgar Wheelock Murdock, of Caryville, Mass., died June 11. Mr. Murdock had been in poor health for the past four years, and had spent his winters in Arizona, coming to Uxbridge during the summer. He was born in Uxbridge in 1869. He attended the public schools, later taking a course in a textile school. He entered the manufacturing business at Caryville, being connected with the Caryville Woolen Company at the time of his death. He was grandson of Moses Taft, one of the pioneer woolen manufacturers in the Blackstone Valley.

Edson S. Spofford, who started the weaving department in the Ann and Hope Mill, Lonsdale, Mass., and was overseer of that department for nearly 17 years, resigning April 1, last, died recently. He was in his 58th year.

New Publications.

[Any work noticed under this head can be obtained through the office of this journal.]

The Annual Official Directory of the Textile Industries and Yarn Trade for 1904, compiled by Textile World Record. Lord & Nagle Company, publishers, 299 Devonshire St., Boston.

This annual work comprises 528 pages and about 20 textile maps showing the location of cities and towns where there are textile industries. It gives railroad connections, population of cities and towns, and its maps are arranged so that any town can be easily found and its distances from centers ascertained. Full information is given in regard to the mills reported,—names of officers, machinery capacity, class of goods made, whether they dye or not, kind of power used, who the selling agents are, who the buyer is. All the mills in a city or town are grouped together under the head of that town, this system of arrangement having been found most convenient to the majority of users. The mills of each class, such as cotton, woolen, knitting, etc., are, however, so plainly designated that their character is ascertained at a glance. The maps have been revised and brought up to date. Besides the full report of the mills under the town in which they are located, there is a complete alphabetical index to all the mills.

Other sections of the Directory contain a report of the yarn trade, giving lists of the mills making and selling different counts of knitting and weaving yarn, showing the sizes of yarn spun and the method in which it is put up; lists of mills doing order and commission work are given and also dyeing, printing, bleaching and finishing establishments, as well as yarn dealers. Manufacturers' selling agents is still another section, also wool, cotton and shoddy dealers, manufacturing clothiers and suit and cloak makers buying from first hands, a list of mills with worsted machinery, etc.

The book is compiled from official returns from the mills, in most instances obtained by personal visit and canvass. The particular feature which makes this Directory of great value is the promptness with which it is compiled and the care with which mills out of business are so reported. The changes that are taking place in mills constantly make any directory full or errors within a short time after its publication, and the facilities of the Textile World Record with its large outside staff permits a rapid and thorough canvass to be made in a short time instead of extending over a long period.

The book is published in two editions, the Office Edition, printed on heavier paper and bound in stiff cloth covers, costs $2.50; Traveler's Edition, of smaller size, printed on thinner paper, and bound in flexible covers, costs $2.00. A combination price is made to subscribers to Textile World Record of $3.50 and $3.00 per year, according to the edition. The constantly increasing sales of this Directory testify to its popularity.

Against the Metric System; by Herbert Spencer; Williams and Norgate, London.

This is the third edition of the late Herbert Spencer's pamphlet against the metric system, which he directed in his will should be published whenever within ten years after his death a bill should be introduced into Parliament for the compulsory adoption of the metric system. In addition to his own views on the subject, the pamphlet includes an extract from Comte de Montholon's "Memoirs," containing the opinions of Napoleon Bonaparte regarding the introduction of the metric weights and measures in France. A number of other appendices are given, all directed against the metric system.

The will directed that the pamphlet should be distributed free to the members of Parliament and put on sale at a nominal price, which has been placed at 3 pence.

Cyclopedia of Engineering; American School of Correspondence, Chicago, Ill.; 4 vols. Price, $10.

This cyclopedia is compiled from practical and comprehensive instruction papers of the American School of Correspondence and is supplied to students of the school at a liberal discount. It is intended to furnish actual instruction to those who are unable to take the correspondence course, just as the school itself is intended to furnish the instruction to those who cannot attend a resident engineering college. The cyclopedia has been prepared especially for home study, and represents actual workshop features and conditions. It is edited by Prof. Louis Derr, professor at the Massachusetts Institute of Technology, and embraces the subjects of electrical, mechanical, stationary, marine and locomotive engineering, tool making, shop practice, heating, ventilation, refrigeration, wiring, mechanical drawing, etc., and includes articles on such subjects as wireless telegraphy, flying machines and automobiles.

Electric Motors for Machine Driving; by Andrew Stewart, A. I. E. E.; S. Rentell & Co., London. Price 50 cents.

This little handbook contains a great deal of useful information regarding the driving of individual machines by electricity, a subject which is attracting much attention at the present time. We recommend it to every manufacturer who is thinking of adopting this plan of power transmission. It is fully illustrated.

Silk Throwing and Waste Silk Spinning; Hollins Rayner; D. Van Nostrand Co., New York City. Price $2.50.

This work treats of a subject on which very little has been published in book form. It is profusely illustrated and indicates much research. The ground covered is shown by the following abstract of the table of contents: The silk worm; Egg hatching; Cocoon reeling and qualities of silk; Silk throwing; Silk waste spinning; Silk wastes; Preparation of silk waste for degumming; Degumming; Combing wastes; Silk waste drawing and preparing machinery; Short spinning machinery; Spinning and finishing processes; Utilization of waste products.

Factory Accounts; Emile Garcke, Managing Director of the British Electric Traction Co., and J. M. Fells, formerly General Manager of the Salt Union; D. Van Nostrand Company, New York City. Price, $3.00.

Although this book does not treat directly of the textile industry, the textile manufacturer will find it of great value in planning a system of accounting for his mill. The development of the factory system has made it essential that a mill owner should know the cost of his goods in detail and be able to survey the operations of his mill by means of a scientific system of bookkeeping. The system of bookkeeping generally found in mills is not suitable for this purpose. It is necessary to supplement it with special accounts relating to the different processes of manufacturing. The book under review places before the reader a statement of a system relating to factory accounts and of the methods by which these particulars can be put into practice and made to serve important purposes in the economy of manufacture. Following is an abstract of the table of contents: Labor; stores; prime cost; stock; fixed capital; surveys; conclusion.

Faults in the Manufacture of Woolen Goods; N. Reiser, Director of the Royal Weaving School at Aachen; D. Van Nostrand Co., New York City. Price $2.50.

This is an English translation of a German work that has already been noticed in our columns. It deals with the causes and remedies of the innumerable imperfections arising in the manufacture of woolen goods. Every woolen overseer, superintendent and manufacturer will find in it much useful information and many hints that will prove of great value in the daily work of the mill.

How to Make a Woolen Mill Pay; John Mackie; D. Van Nostrand Co., New York City. Price $2.00.

The title of this book will attract the immediate attention of many in this country and Canada who are at present struggling with the problem of how to make a woolen mill pay. The work deals principally with the technical side of the question and contains much valuable information regarding mill management. The following abstract of the table of contents gives an idea of its scope: Blends of clean scoured wools; Dyed-wool book; The order book; Pattern duplicate book; Management and oversight; Constant inspection of mill departments; Importance of delivering goods on time and right in strength, shade, etc.; Plums.

Workshop Costs for Engineers and Manufacturers; Technical Publishing Co., London, England. Price $6.00.

This elaborate work treats of estimating cost in machine building and engineering. It is divided into five parts, as follows: The Nomenclature and Registration of Patterns and Materials; The Recording and Analysis of Labor; Manufacture or Repetition Work; The Stores and Assembly Work; Contract or Special Work. It is freely illustrated and the subject is handled thoroughly and systematically.

The Garment Dyer and Cleaner (Manuel methodique de l'art du Teinturier-Degraisseur); A. F. Gouillon; Garnier Freres, Paris, France. Price $1.75.

This is the third edition of a work on dyeing and cleaning garments which has met with a large sale in France, where the art of garment dyeing and cleansing has reached its highest development. The aim of the author has been to prepare a comprehensive handbook on this important branch of the textile industry. The 642 pages treat of such a great variety of processes and fabrics that it is impossible to do justice to the book by making an abstract of its contents. It treats of the equipment of garment dyeing and cleansing establishments, the processes of dyeing, cleaning and bleaching, removal of spots and the finishing of fabrics. The last part of the book treats of special processes, such as the dyeing and cleaning of small objects like gloves, feathers, straw hats, lace, wigs, articles of ivory, bone and wood, and the disinfection of clothes, furniture, etc. The text is in French.

Paper Yarn (Papierstoffgarne); by Prof. E. Pfuhl; G. Loeffler, Riga, Germany. Price $2.00.

The production, uses and properties of paper yarn are treated in this book of 137 pages, which is illustrated with many drawings of the various machines required in what is practically a new industry.

Dyeing (Faerberei); by Dr. A. Ganswindt; J. J. Weber, Leipzig, Germany. Price $2.00.

This book of 477 pages gives the outlines of the mechanics and chemistry of dyeing textile fibres. The following subjects are considered in the order named: Water in Dyeing; Mordants and Chemicals; Silk, Wool and Silk and Wool Mixtures; Cotton; Cotton and Silk Mixtures; Cotton and Wool Mixtures; Linen; Various Textile Fibres; Natural Dyestuffs; Artificial Dyestuffs. The work is freely illustrated and is unquestionably a valuable, practical handbook on dyeing.

Manual for the Chauffeur (Manual du Chauffeur); A Jaunez; J. Hetzel, Paris. Price 50 cents.

This is a work of 265 pages treating of the care and management of automobiles. It is freely illustrated and contains a description of the different types of French machines. The text is in French.

Profit Sharing in Germany, Austria, and Switzerland (Die Gewinnbeteiligung der Arbeitnehmer); by Victor Boehmert; O. V. Boehmert, Dresden, Germany.

In the first portion of the book the author gives statements showing the results of profit sharing plans in forty-two different concerns of Germany, Austria and Switzerland. These statements are classified, showing the amounts covered by interest, labor, insurance, etc., including the extra manufacturing expenses incurred in providing educational and social opportunities for the employees. The author has collected a large amount of valuable information bearing upon the question of the worker's share in the profits of manufacturing and will undoubtedly prove very valuable to students of this subject. The text is in German.

New Diagrams for the Theory of Turbines; by Dr. Rudolf Camerer; Richard Dietze, Berlin; price 50 cents.

A treatise on turbine water wheels, which is illustrated by diagrams, and treats the subject from a purely theoretical standpoint, suited only for those versed in the higher branches of the science. The text is in German.

Business Literature.

Novelty Yarns, Vol. 1. Published by the Second Year Class of the Philadelphia Textile School, Philadelphia, Pa.

The second year class of the Philadelphia Textile School is to be congratulated for having issued a volume in which there is not a dull page. It begins with a series of chronicles, followed by Snub Yarns and a Prophecy, in which the future career of various members of the class is foretold by an experienced prophet and seer. Poem Oddities occupy one page. A directory of the class gives some detailed information regarding the personality of its members. The faculty come in for marked attention in which a humorous description of their peculiarities does not conceal the esteem in which they are evidently held by the students. The history of the seniors, third year personals, and a chapter devoted to the freshmen are all written in the same lively style. Excellent illustrations are found throughout the work, which also contains a list of the various college societies.

Graphite as a Lubricant; Joseph Dixon Crucible Co., Jersey City, N. J.

Much useful information regarding lubrication is given in this pamphlet which calls especial attention to the merits of graphite of which the Joseph Dixon Crucible Co. is a large manufacturer.

Cotton Gins; The Continental Gin Co., Birmingham, Ala.

This illustrated catalogue describes the extensive line of cotton and cotton seed machinery built by the Continental Gin Co., including seed cotton elevators, seed blowing system, cotton storage house, main belt or system plain gins, main belt or system huller gins, apron cleaning feeder, upright single drum cleaning feeder, distributer feeder, battery condenser and lint flue system, revolving double box presses, friction tramper, hydraulic pumps, gin saw sharpeners, munger ginner's compress, cotton seed linters, engines and boilers, standard drive plain gins, belt tighteners, standard drive huller gins, front feeders, horizontal top feeders, single gin condensers, single box presses.

Oil versus Grease; Joseph Dixon Crucible Co., Jersey City, N. J.

A booklet containing much useful information regarding the comparative merits of oil and grease for lubrication and incidentally calling attention to graphite as a substitute for both.

Sewing Machines; Willcox & Gibbs, New York.

A booklet in which various types of the automatic sewing machines built by this well-known concern are illustrated. Notice is given of their return to their old quarters, the Willcox & Gibbs Corner, Broadway and Bond St., where they were formerly located for 35 years.

Ring Travelers; De Haven Mfg. Co., Brooklyn, N. Y.

This is a price list and descriptive catalogue of ring travelers which gives much useful information regarding this important adjunct to ring frames.

Pure Water and Pure Air.

F. Q. Hartman, of Danville, Pa., operating a large silk mill, is feeling much pleased at the results accomplished by two recent improvements installed in his plant, which not only facilitate its satisfactory and economical operation, but greatly contribute to the comfort of the employees, by supplying them with pure and cool air of the right humidity. One of these improvements is the Aerophor system of air moistening, well-known in cotton mills, but not hitherto in use in the immediate neighborhood, where Mr. Hartman's mills are located, and its beneficial effects are attracting much interest and attention in that locality. The pure water system of the Philadelphia Water Purification Co., 1700 North 12th Street, Philadelphia, now supplies the plant with chemically pure water, which is thoroughly filtered. Mr. Hartman uses this water not only in connection with his silk baths, which require pure soft water, but also uses 12,000 gallons daily as boiler feed, and where previously the boilers were thickly encrusted with scales, they are now found to be clean with no signs of crustation, and there is found to be a large saving of coal, due to the lessened quantity required to keep up steam.

From Canada to Mexico.

The Hopkins Machine Works, Bridgeton, R. I., are getting a good share of machinery orders in their line, and have been very busy during the past few months. Among recent shipments was an eight string washer to A. L. Sayles & Sons' mill in Pascoag, R. I., which took the place of one of the few wood framed machines now in use that was built by this same concern twenty years ago. They have also installed a piece dye tub (6 string) in the plant of Lawrence Keegan, Wilsonville, Conn., and are now building two machines which go to widely separated mills, one a piece dye machine to go to Horn Bros. Woolen Mills, Ltd., Lindsay, Ont., and the other, a 4 string washer, to go to a plant in Mexico, and near at home an 8 string washer for the Geneva Mill, Geneva, R. I.

The St. Louis Exposition Guide.

Are you going to St. Louis? Are you interested in the world's grandest exposition? If you intend going, or if you just wish to find out what's there, send to the Boston & Maine Passenger Department, Boston, for the St. Louis booklet. It contains forty pages of interesting reading matter with illustrations, a map of the grounds, a map showing the route, also the different rates and routes via the Boston & Maine Railroad. It doesn't cost a cent. Simply send a postal card requesting, and it will be mailed free.

A Visit to the Turkish Textile Works.

The Textile Journal, London, gives the following account of the visit of its editor and proprietor, S. Chas. Phillips, to the textile works of the Turkish Government:

"At the chief bureau we were welcomed sedately, in true Eastern style, by the chief director, a venerable grey-beard, who said ever so many nice things in Turkish. Permission was graciously accorded to look through the famous works, and the sergeant and an old soldier were deputed to form our escort.

"We were trotted through the carpet-weaving works first—a huge single-story building of immense length, and filled with hand looms of various sizes. At each frame there were three girls, of about fifteen or sixteen years, and five or six young children—all of them happy and contented at their work, their nimble fingers weaving the patterns set before them with marvelous rapidity and skill. The manager of this department was introduced to me. 'What is the value of the carpet which these girls are weaving?' I asked. 'Oh, about $1,200,' he answered. 'We make them up to $3,000 to $3,500 apiece.' There must have been quite 400 girls in this building, some of the looms being worked entirely by children of six or seven years. These youngsters get no wages; they are merely making themselves proficient by free training. The carpets were something exquisite in design and colors—colors which even centuries would not fade.

"As we approached each loom, the girls were singing some plaintive native ballad, but they stopped as soon as they caught sight of us. We became objects of great attraction for them, as the word had been passed round by the stationmàster that the captain and I were English.

"It is very rarely an Englishman penetrates these works in the wilds of Asia Minor. In another building, the bigger and older girls gathered round us and eyed us with considerable curiosity. One raven-haired, dark-eyed beauty, in baggy Turkish trousers, actually winked at me, and asked me something which the stationmaster said he was afraid he couldn't translate! As for the captain, we nearly lost him several times, only to find him surrounded by a veritable young harem, and beaming on the bevy of Oriental beauty with huge delight.

"I noticed that in some rooms there were differently costumed girls. It was explained to me that the different castes and religious sects were kept apart; this was particularly observable with the Armenians and Turks. We next visited the cotton-spinning mill, which was replete with the latest machinery from Lancashire. Next, the woolen mill, which had a lot of new machinery just installed by eminent Lancashire and Yorkshire firms. The silk-spinning and dyeing sections were particularly interesting, and showed that the Sultan's Government was alive to the latest machinery and processes in vogue in Europe. About 3,000 hands are employed, chiefly young girls and children. We were then taken to see the pavilion erected by the Sultan to receive the German Emperor, and as we passed through the gates we were accorded a military salute by the guard. The pavilion we found close by—a beautiful building, consisting of two rooms; the carpets, hangings of silk, and upholstery were all manufactured at the works, the total cost exceeding $125,000, and, in addition, the Emperor was presented with about $500,000 worth of carpets by the Sultan.

"We were afterwards taken through the great warehouses in which the carpets and silks were stocked, the value there, at the time, being estimated at about $1,000,000.

The Oconee Knitting Mills at Walhalla, S. C., have placed their order for Invincible knitting machines with the E. Jenckes Mfg. Co., of Pawtucket, R. I.

Non-Shrinking Woolens.

Charles H. Heyer, the general sales agent for the process recently placed on sale to prevent woolen goods from shrinking has taken rooms in the Real Estate Trust Building, Broad and Chestnut Streets, Philadelphia.

The laboratory, which is under the personal direction of Mr. Althouse, the originator of the "Nevershrink Process," is being enlarged and refitted. They have a complete plant here for treating samples, etc., and many inquiries are receiving careful attention. The laboratory is located at Reading, Pennsylvania.

New Knitting Machine Agency.

Messrs. D. Rheinhauer & Co., 136 Greene St., New York, have taken the American agency for the extensive line of knitting machinery built by Wilhelm Bach, Apolda, Germany. This includes machinery for all kinds of fancy work, including vests, sweaters, golf jackets, shirtings, etc. Many machines of this make are already in use in this country with much success. A special feature is the full automatic power machine for goods of this character. Besides this agency, the firm of D. Rheinhauer & Co. carry a full line of knitting mill supplies, including needles, parts, etc., and insure prompt delivery.

The Allis-Chalmers Machinery at St. Louis.

Visitors at the St. Louis Exposition should not fail to see the 5,000 h. p. Allis-Chalmers engine and Bullock electric generator in the Machinery Building. This plant furnishes electric energy for the decorative lighting for the buildings and grounds of the exposition. The installation stands in the centre of the machinery building, with commodious spaces all about it, affording views of the largest generating unit ever placed on exhibition. These spaces have been so fitted up by the Allis-Chalmers Company as to afford accommodations the like of which are not to be found at any other place within the limits of the World's Fair. Visitors will here find not only comfortable resting places, but also writing tables and stationery, attendants who will receive and forward mail and telegrams, and who will check the parcels and wraps of visitors and provide iced water, all, of course, free of charge.

Need Not Pay for Formula.

A. N. Dubois, the inventor and owner of the sanitary process of dyeing fast black on hosiery and yarn, has rented a building on Front and Lehigh Ave., Philadelphia, where he will manufacture his sanitary fast black in liquid as well as powder form, and will sell it direct to the trade.

Besides this he will make a specialty of chrome compounds for fast black, particularly trichromate, which has much more oxygen than the chrome and making possible a cheap black almost ungreenable. He will also manufacture softening and finishing compounds.

Mr. Dubois finds that many mills find it more convenient to buy the made-up black dye, rather than have the trouble of making it themselves, but more especially because it stands the high heat of summer, oxidizes so well and does not tender the goods.

The price has been fixed so that a good fast black, almost ungreenable, does not cost, all told, over two cents a pound, and in order to extend its use he states that those that buy this fast black dye from him will be permitted to use it on lisle finish without payment of any royalty under the patent, and this also saves the necessity of paying $500 to $1,000 for the formula, as they get instructions free of charge with the dyestuff.

This new departure of Mr. Dubois does not mean that he will give up his former business of contracting for complete dye plant outfits for hosiery. He will still maintain that feature of his business, and later expects to start a laboratory, where he will be able to give instructions.

Scenic Routes to St. Louis.

The St. Louis Exposition is indeed proving all that its projectors prophesied for it. The buildings are all open; the exhibits are in readiness, and the superb management and order is truly wonderful. One feature which appeals to the visitor is the ease and facility for transportation around the grounds. The Intra-Mural Railway will take one to any section of the enclosure. The strange collection of foreign races take kindly to their temporary homes, so natural and faithfully produced are their native abodes and environments. At the Philippine Exhibit, one almost imagines one's self in the far away islands, while watching the agile natives work and frolic in their huts and surroundings. In another portion Ottomans and subjects of the Sultan are living in indolent Eastern fashion; and in the Arctic Region hardy Esquimaux are contented midst ice and snow and polar surroundings.

The buildings represent architecture of various styles and ages; and the "Pike," which corresponds with the famous "Midway," far surpasses in wonderment the Chicago show.

Throngs of people from New England and the East, from now until the last of November will travel towards St. Louis; and to meet the demands of these people, the Boston & Maine Railroad has arranged to run to St. Louis via the following routes: Through the famous Hoosac Tunnel, within plain view of the Berkshire Hills, through the peaceful Deerfield Valley, and west through Cooper's country, the Mohawk Valley, to Buffalo, where one may stop over and visit Niagara Falls; then on to St. Louis via the Wabash. Should you desire to journey through that famous garden of southern New York via the Erie route along the shores of the winding Chemung, through the fertile lands and busy cities of the middle west; or if you desire to visit Canada, taking in Montreal, Toronto and stopping at Niagara Falls, traveling in the initial portion of your journey through northern New Hampshire in view of the White Mountains, along the northern shores of the Connecticut in Vermont —this trip being the Grand Trunk Route—you can do so. Make your selection, or send to the General Pasenger Department, Boston & Maine Railroad, Boston, for the St. Louis Exposition Booklet, which gives all information in regard to the Exposition and how to get there. It will be mailed free.

Know the Truth About Your Business.

It is not enough for a man who conducts a large industrial establishment, and particularly a manufacturing establishment, to be expert in the processes of forming fabrics, nor is it enough that he should be energetic and skillful in the selling of his wares. There is a positive necessity that he should narrowly watch the collections of his accounts, the cost of all the processes in his mill, the waste that is always more or less unavoidable, and keep a constant and accurate watch upon even the smallest matters that are likely to eat up the profits. It would be easy to name many manufacturing enterprises which have gone to wreck simply because the business did not have this minute care and ultimately ran away with the men who managed it.

The Audit and Appraisement Company of America, with the main office at 1325 and 1326 Land Title Building, Philadelphia, and New York office at 55 Liberty Street, make a specialty of auditing and examining the books of manufacturing companies. This company has an authorized capital of $100,000, and its officers are as follows: Herbert G. Stockwell, C. P. A., President; Frank M. Hardt, Secretary and Treasurer; William W. Porter, General Counsel; Rear Admiral Melville, Ex-Chief Bureau Steam Engineering U. S. N., Engineer-in-Chief. This company, as its name indicates, is an auditor and appraiser; it audits books and accounts, balance sheets and financial statements of business houses. It undertakes to open books properly and to instruct book-keepers. To audit the accounts of trustees, executors and other such persons; to help counsel in making settlements of complicated accounts; to examine the books of bankrupts, to examine the affairs of bankrupts and to install cost systems for manufacturing plants.

Acting as an appraiser it makes expert examination of all kinds of properties, and searching engineering investigations of railroads and other projects. It compiles periodic reports for corporation officers and in short gives expert knowledge in every field of technical industry to counsel in court cases.

These things are but a part of the work done by this corporation which has performed such service for many of the largest concerns in this part of the country. It is difficult to exaggerate the importance of having such expert ability at the command of the owners of large projects comparatively at a very small price. The directors of

the company, all of them well known in Philadelphia, and of the highest character, are as follows: R. Dale Benson, president of the Pennsylvania Fire Insurance Co., Harry F. West, president of the Penn Mutual Life Ins. Co., Francis B. Reeves, president of the Girard National Bank; Henry M. Dechert, president of the Commonwealth Title Ins. and Trust Co., Hon. William W. Porter, ex-Judge Superior Court of Pennsylvania, George Morgan, of George P. Morgan Co., James F. Hope, of Thos. Potter Sons & Co., Inc., W. F. Eidel, N. J. Corporation Guarantee & Trust Co. and Herbert Grant Stockwell, C. P. A.

July Opens the Season in the Mountains.

To go away from the city; to seek the shelter and protecting quietude of the country where the singing of the birds and the vision of flowers and verdant pastures will infuse a new spirit in the soul and vigor in the body is the desire of every person seeking a resting place for the summer. And in New England, the "summer play ground" of America, the mountains take the first rank. Among the "White Hills," whether midst the rushing cascades and towering ledges of the Crawford Notch, or on the cloud enveloped summit of Mt. Washington; whether midst the natural wonders of the Profile region—the marvelous Echo Lake, or the natural sculpture of the Presidential cliffs; whether in the depths of the sylvan Cathedral Woods, or the peaceful territory of the Intervale, there is a pleasure peculiar only to the White Mountains.

Send six cents to the General Passenger Department, Boston & Maine Railroad, Boston, for the beautiful portfolio of the choicest views in the mountains entitled "Mountains of New England." For two cents, the descriptive book "Among the Mountains," containing some choice illustrations of mountain scenery and sixty pages of interesting reading concerning the White Mountains will be mailed to any address.

Enlarging Dye Works.

W. M. Drexler & Co., Worth and Granite Streets, Frankford, Philadelphia, have recently put in a new 85 h. p. boiler and five new kettles. They are dyers of colors on fancy yarns and make a specialty of Turkey red, fast black, worsted and jute. This firm, while in business but a short time, are becoming well known throughout the industry. They guarantee satisfaction on all work done by them and invite manufacturers to give them a trial.

In Their New Rope Works.

The Columbian Rope Co., manufacturers of transmission rope and all kinds of manilla and sisal rope, have moved into a modern new factory which has just been completed at Auburn, N. Y., on the other side of the city from where their works were formerly located. Their old works were, like almost all growing industries, extended from time to time as best might be, but their new works have been skilfully laid out to meet every requirement of their business, as well as to provide for future growth. The works are of great extent and machinery equipment of the highest order. The power plant is separate, and railroad tracks run into the yard. This company has a large and growing trade with the textile industry and expects to pay still more attention to its requirements in the way of transmission rope, baling and tarred rope.

Yarn from Wood Fibre.

In our June issue there was mention of a new yarn made from wood fibre, called Silvaline, which attracted some attention. We learn that Messrs. Moeller & Littauer, importers and yarn dealers, 109 Greene St., New York, are the American representatives of the Silvaline Syndicate of United States and Canada, and have samples of cloth and yarn to show to interested parties. At the present time, these goods are all imported, but we understand that negotiations are in progress for the manufacture of the yarn in this country under the process which is patented for the United States and Canada.

One Million in Use.

L. T. Houghton's steel thread boards and metal back rails are now generally recognized as a standard thing, and even former sceptics now admit that they are a good thing, but not worth the extra cost. Mr. Houghton answers that criticism by citing cases of scores of the most progressive mills who, after having equipped numbers of their frames and made comparisons for a year or more, have replaced all the wooden thread boards with his metal board and back rails. A most striking instance of this is the case of the Fall River Iron Works, the largest cotton manufacturing company in the world, who, after using 86,000 steel thread boards for nearly a year, decided to replace all their wood thread boards with steel. Three of their five mills have now over 200,000 of them in use, and Mr. Houghton expects to equip mills Nos. 3 and 4 before the winter. He has recently filled a sixth order from Canadian Colored Cotton Mills in Canada, who expect to change over all their thread boards to steel from time to time, as opportunity offers. The Courtney Mfg. Co. at Newry, N. C., is another mill that will change all their thread boards to steel, and who will soon receive equipment of 20,000.

New Bobbin Mill.

The Vermont Spool & Bobbin Co., of Essex Junction, Vt., has recently purchased the old marble mill property in Burlington, Vt., and expects in the near future to erect a modern mill property in every way suited for its requirements, which will give it needed additional facilities. This property contains nearly four acres, centrally located, and with tracks for unloading cars into the yard. There is a good opportunity for some wood working plant to locate on the same property and use a part of the power, which is more than is directly needed by the owners.

Finishing Compounds.

The Arabol Manufacturing Co., 100 Williams St., New York City, make a specialty of soluble oils, alizarine assistants, Turkey red oils of different percentages, and other compounds for use in finishing, dyeing and printing textile goods of every description. Their products are sold under the trade mark, The Sphinx, which has become a guarantee of excellence.

Mill Soaps.

The importance of uniform mill soaps of a good body cannot be overestimated. The success of manufacturing woolens often depends upon the proper cleansing and fulling of the goods, for which soap is essential. James J. Tully, 179 Master St., Philadelphia, Pa., makes the manufacture of mill soaps a specialty and has brought to bear a long experience and thorough knowledge of the conditions which must be met in a mill. His success in this direction has been phenomenal and is demonstrated by the hold he retains upon his customers. A customer obtained for Tully's soap is one retained. Manufacturers who are having difficulties in fulling and scouring will do well to consult with Mr. Tully and give him an opportunity to prescribe soap of the required composition.

The Cross Oil Filter at the St. Louis Fair.

The authorities in charge of the immense 30,000 H. P. power plant at the St. Louis Exposition, have installed a large No. 3 Cross oil filter manufactured by the Burt Mfg. Co., of Akron, O. Those of our readers who visit the fair and are interested in the mechanical features should by all means take this opportunity of seeing the Cross oil filter in practical operation.

Besides the filter used by the exposition authorities, the Cross oil filter has also been ordered by the C. H. Bradley, Jr., Co., of Pittsburg, for use in connection with their exhibit at the fair. Likewise the Buckeye Engine Co., of Salem, Ohio, and the De Laval Steam Turbine Co., of Trenton, N. J., have ordered No. 3 American filters, made by the Burt Mfg. Co., to be used at the fair in connection with their exhibits.

Return from Europe.

A. M. Mattice, chief engineer of the Allis-Chalmers Co., has returned from his European tour of inspection. While in Europe Mr. Mattice visited the hydraulic machinery works of Escher Wyss & Co., of Zurich, and arranged important details concerning the manufacture in the United States of their lines of product. He also inspected the Nurnberg Gas Engine Works, at Nurnberg, and at the well-known engineering establishment of Willans & Robinson, at Rugby, England, he paid particular attention to the products and methods of manufacture of the Steam Turbine Advisory Syndicate, of which important organization Allis-Chalmers Co. is the American member. Mr. Mattice had several important consultations in London with Mr. Yarrow, the famous torpedo boat builder, on the subject of turbines for marine purposes, and while on the Continent he made, in the Allis-Chalmers interests, a series of exhaustive tests of the Zoelly steam turbine, of which so much has recently been heard. The results of Mr. Mattice's European visit of inspection will be awaited with a good deal of interest by American engineers.

Philadelphia Textile School Graduates.

Following is a list of the graduates and prize winners at the Philadelphia Textile School of the class of 1904. Regular textile course: Jay T. Aungst, James T. Hickman, Jr., Abraham A. Levy, Robert C. Liehr, Herbert M. Remington, Louis E. Ruehlman, Frederick J. Siebrecht, Clayton P. Stearns, Daniel J. Wade, George W. Wittenberg. Chemistry and Dyeing Course: Leicester DaCosta Ward. The Textile World Record Gold Medal, for general excellence in chemistry and dyeing awarded to James Julius Wittenberg; honorable mention to John Joseph Keenan. New England Cotton Manufacturers' Association Medal, for General Excellence, regular course, third year, awarded to Abraham Albert Levy; honorable mention to Louis Edward Ruehlman and J. Townsend Hickman, Jr. Associate Committee of Women's Prize, $10.00, for best executed work in Jacquard Design, third year, awarded to George W. Wittenberg; honorable mention to Abraham Albert Levy. The Miss Clyde Prize, $10.00, for best executed work in Jacquard Design, second year, awarded to Benjamin Nelson Chanalis; honorable mention to Schuyler J. Taylor and J. Everett Emerson. Mrs. Frank K. Hipple Prize, $10.00, for special work, awarded to Charles Allan Oehm; honorable mention to William J. Lockett. The Elizabeth C. Roberts Prize, $10.00, for best work in Color Harmony and Design, first year, awarded to Louis Hart Talcott; honorable mention to Robert L. Dawson, Robert E. Brooke and Casimir Mekszras. "Dyer's Trade Journal" Prize—Chemical Balance, for best seminar work in Chemistry awarded to James Julius Wittenberg; honorable mention to Horace Smith. Prize Scholarships for School Year 1904-1905, awarded to Louis Hart Talcott, Evan G. McIver, Edward Kaufman (evening class), and Ernest B. Cary.

The Good Old Summer Time.

When and where to go for a vacation is a question which perplexes us all. There are beautiful places in every section of the country, but to reach them at a moderate rate and within a reasonable time is a great barrier.

New Jersey has bounded to the front as a summer resort and well she might since her shore is within reach of all. Her attractions are too numerous to mention, and the accommodations provided for the tourist being unequaled anywhere in the land. The famous beach resorts of New Jersey are Atlantic Highlands, Seabright, Long Branch, Asbury Park Ocean Grove, Belmar, Spring Lake, Sea Girt, Point Pleasant, Atlantic City, Ocean City, Cape May and Beach Haven. Each is unique in environments and caters to the best class of summer travelers. Every convenience is at hand for genuine enjoyment and each can be reached by rail or boat, the lines are both operated by the New Jersey Central and C. M. Burt, G. P. A., 143 Liberty St., New York, has issued an illustrated brochure detailing the beauties and advantages of the above resorts and a hundred others. This book will be sent to any address upon receipt of six cents in stamps, and one looking for a vacation region would do well to send for it.

Beautiful Booklet Free.

The summer resort book of the Boston & Maine Railroad contains a list of the numerous mountain, seashore and inland resorts of Maine, New Hampshire, Vermont, Massachusetts, Canada and the Provinces. The routes and railroad rates are given, also the accommodations and the price per week and day at the hotels. The book contains ninetv-six pages of useful information and some beautiful illustrations of scenes in Northern New England.

This book will be mailed free by the General Passenger Department, Boston & Maine Railroad, Boston, to any address.

A Mecca for Shriners.

No more appropriate place could have been chosen nor a more opportune time selected than Atlantic City for the meeting of the Imperial Council of Mystic Shriners. Atlantic City is a place of a thousand in as much as its make-up especially in the summer is that of fun and gaiety. There is every thing the occasion might demand at the famous resort and for a good time it can not be beat. There is always fun on the board walk and piers and the bathing is unequaled. The boating or sailing facilities are the best and no matter which way you turn there is something doing. The hotels numbering more than 200 are marvels as hostelries and the typical "boniface" is ever present. Each hotel is complete to the minutest detail and grill rooms, rathskellers, palm gardens, sun parlors, music halls and the like are featured at each house. Atlantic City is decidedly accessible because of the excellent train service furnished by the New Jersey Central from New York. Fast trains leave station foot of Liberty Street at 9.40 a. m. and 3.40 p. m., making the run in three hours and passing through the famous resort Lakewood. For the occasion of the Imperial Council the New Jersey Central has placed on sale reduced rate tickets good going on July 11 and 12, and good returning July 13 to 23 and with the famed seashore resort at its height there is no reason why everybody who goes there should not have a good time. If you want a time table write to C. M. Burt, General Passenger Agent, New Jersey Central, New York City.

Recent Textile Patents.

BOBBIN. 762,422. James E. Lemyre, Manchester, N. H.

BOBBIN HOLDER. 762,088. John Roney and John C. Rae, Woonsocket, R. I.

BOBBINS. Mechanism for Removing Waste from Yarn. 761,976. Alexander Makepiece, Fall River, Mass.

BOBBIN AND SPINDLE CONNECTOR. 760,704. Frederick W. Saworski, Boston, Mass.

CARD CLOTHING TO CYLINDERS. Machine for Applying. 760,696. Charles Mills, Newton, Mass., assignor to Saco & Pettee Machine Shops, Newton, Mass.

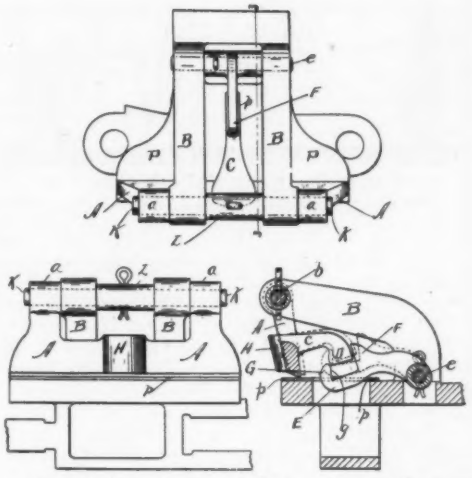
CARD CLOTHING FOR NAPPING MACHINES. 761,470. David Gessner, Worcester, Mass.

CARDING MACHINE. 761,427. Charles Surprise, Stockport, Eng.

CARPET FABRIC. 762,210. Charles T. Stewart, Philadelphia, Pa., assignor of one-half to Archie C. James, Philadelphia, Pa.

CLOTH STEAMING MACHINE. 761,471. Ernst Gessner, Aue, Germany.

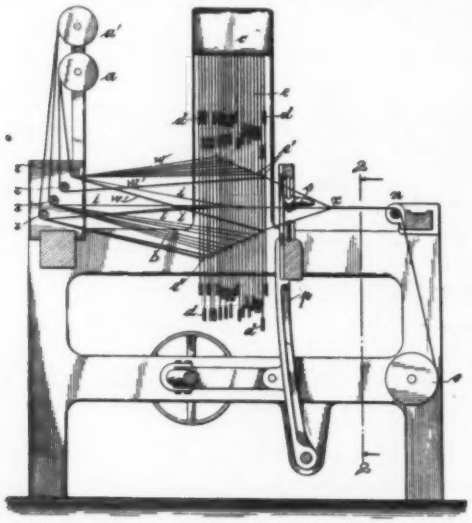
CLOTH TENTERING MACHINE CLIP. 761,967. Henry W. Honeyman, Pawtucket, R. I., assignor to Textile Finishing Machinery Co., Providence, R. I. The better and more delicately-working clips have been made with the finger separate from the upper jaw and pivoted upon its own independent pivot. With very thin goods particularly, it is important that there be as little pressure as possible upon the goods by the finger while preserving the quick and positive action of the upper jaw when it is once released from the finger. Various attempts have been made to obtain these results by counterbalancing a portion of the weight and in other ways, but so far as known they have all proved in practice more or less defective. This invention has in view the same object of reducing the weight upon the cloth, while permitting the upper jaw to fall quickly when released, but it is attained in a new, simple, and effective manner.



COMPOUND FABRIC. 761,051. Friedrich B. Uebel, Plauen, Germany, assignor to The Firm of Gebruder Uebel, Plauen, Germany.

LOOM FOR WEAVING DOUBLE-FACED SILK RIBBONS. 761,483. Fritz G. Hettling.

College-point, N. Y. This invention has reference to looms for weaving double-faced silk ribbons, and relates particularly to looms used for manufacturing that class of ribbons which are made of double satin or satin and ottoman. Those double-faced silk ribbons are usually made of the heaviest of goods and are often manufactured with two colors. Heretofore these ribbons have been made with one shuttle in the loom for each ribbon. Assuming that a ribbon was manufactured whose upper surface should be white, while the lower one should be black, then it could not be avoided that the dust of the black silk settled on the white silk unless special mechanical devices were used



which were incorporated in the loom for the purpose of preventing this. When the threads are raised and lowered during the process of weaving, then the black threads cross the white ones, and the dust of the black silk settles on the white silk. It is one feature of this invention to avoid this deficiency without special mechanical devices.

LOOM FOR WEAVING ORNAMENTAL FABRIC. 762,525. William G. Hartley, Amesbury, Mass., assignor to Hartley Loop Weave Co., Amesbury, Mass.

LOOM FOR WEAVING PILE FABRIC. 762,526. William G. Hartley, Amesbury, Mass., assignor to Hartley Loop Weave Co., Amesbury, Mass.

LOOM FOR WEAVING PILE FABRIC. 762,528. William G. Hartley, Amesbury, Mass., assignor to Hartley Loop Weave Co., Amesbury, Mass.

LOOM FOR WEAVING PILE FABRIC. 762,527. William G. Hartley, Amesbury, Mass., assignor to Hartley Loop Weave Co., Amesbury, Mass.

PILE FABRIC AND MANUFACTURE OF SAME. 760,986. Harry Hardwick, Philadelphia, Pa., assignor to Ivins, Dietz and Metzger Co., Philadelphia, Pa.

PILE FABRIC. Woven. 760,985. Harry Hardwick, Philadelphia, Pa., assignor to Ivins, Dietz & Metzger Co., Philadelphia, Pa.

SHUTTLE.—Weaver's. 761,099. Gustav Preiss, Pabianice, Russia.

SPINNING APPARATUS. Yarn. 760,973. William F. Draper, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

SPINNING FRAME CLEARER. Ring. 762,163. William H. Gordon, Fall River, Mass. This invention relates to that class of devices which are designed to keep the top rolls on ring-spinning frames free from "fly" and dirt, its object

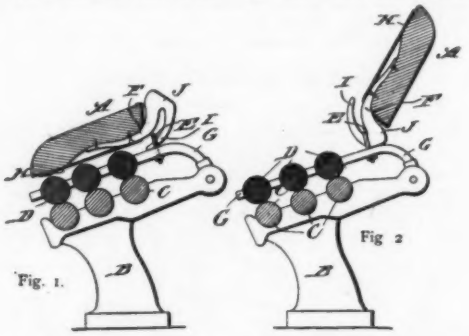


Fig. 1.

Fig 2

being to provide means to obviate the removal or detachment of the clearer-board from the roll-stand or other means of support. The invention resides in peculiar hinging means adapting the clearer-board to be lifted for inspection and cleaning, which means shall not only support the clearer-board at turned-up position, but be adapted for attachment to any type of drawing-roll support now commonly used on ring-spinning frames.

SPINNING FRAME. Ring. 762,640. Rudolf Kron, Guizard, Germany.

SPINNING FRAME SEPARATOR MECHANISM. 763,121. Henry K. Smith, Jamestown, N. Y.

SPINNING FRAME SEPARATOR MECHANISM. 763,120. Henry K. Smith, Jamestown, N. Y.

SPINNING MACHINE DOFFING APPARATUS. 761,980. Joseph F. Muheim, Warren, Mass.

SPINNING RING. 761,086. Lemuel Mellett, Somerville, Mass., assignor of nine-sixteenths to Edward Glines, Somerville, Mass., Joseph F. Flanagan, Newton, Mass., and Miles B. McDonnell, Boston, Mass.

SPOOLING MACHINE STOP MOTION. 761,196. George P. Bosworth, Pawtucket, R. I., assignor to George W. Payne & Co., Pawtucket, R. I.

TWISTING MACHINE. Thread. 760,623. James M. Harrison, Rochester, N. Y., assignor to Wheeler & Wilson Manufacturing Co., Bridgeport, Conn.

WOOL FAT. Recovering. 761,265. Charles E. Swett, Providence, R. I., assignor of one-half to Robert H. Hutchison, New York, N. Y.

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JOHN WHITELEY & SONS, Card Clothing for Cotton; Tempered Steel, Plough Ground, Needle Pointed.

L. M. TETLOW & SONS, Card Clothing for Woolen and Worsted; Tempered Steel, Needle Pointed.

J. GREENHALGH & SONS, Cotton Waste Willows, for Fly, Strips, Picker Droppings, etc.

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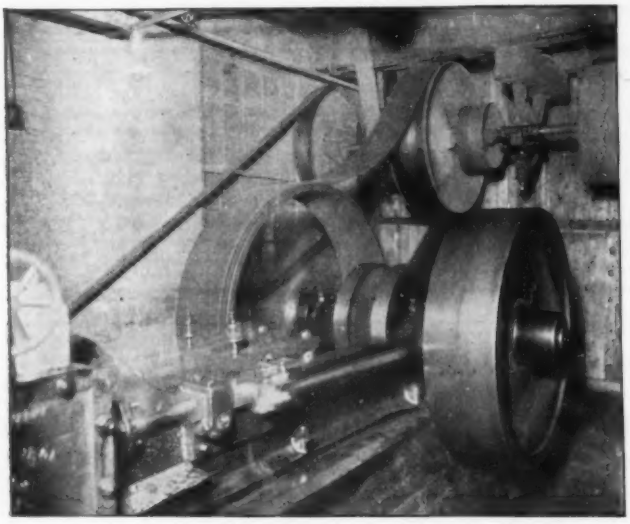

SHORT CENTERS.

PENINSULAR TOOL MFG CO

DETROIT MICH Jan 21 1904

CLING-SURFACE Co Buffalo N Y

Gentlemen:—Herewith find photograph of our main belt which we consider a good example of the new method of running belts with Cling-Surface which live manufacturers are taking advantage of.

It is of special interest because of the belt's being able to carry full load on such short centers and yet run slack, without slipping.

The engine is 35 H. P., 180 R. P. M. The belt is double leather, 10" face, 8' centers. Main pulley 4' 6" and driven pulley 4'. There is 15" slack in the belt.

We have used Cling-Surface in this belt since January 5, 1903, and today it is pliable, in the best condition, and not sticky, but with a surface clean —looking and feeling like black velvet.

We never have to take it up and it does its work daily, overloads or underloads, with no complaint or nursing.

PENINSULAR TOOL MFG CO

H W BULL Sec'y and Treas

This belt shows how absolutely Cling-Surface stops belt slipping and without any adhesion. Note how steady it is. Power delivered as positively and evenly as a direct connection.

You have looked for Cling-Surface for many years. Now it is ready for a trial and satisfaction or money back. Anywhere, any time. Order for trial.

Cling-Surface Co 199-205 Virginia St Buffalo N Y

NEW YORK BOSTON PHILADELPHIA

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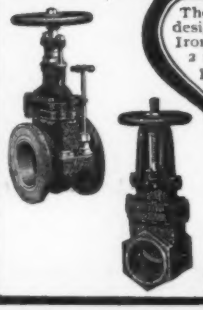

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Buyers' Index.

The addresses of builders of mill machinery and dealers in mill supplies, whose names appear in the following classified index, may be found upon referring to their advertisement. The Alphabetical Index to advertisers follows this classified list. Buyers who are unable to find in these classified lists such machinery or supplies as they desire, are invited to communicate with the publishers, who can, in all probability, refer them to proper sources.

Advertisers whose names do not appear under desired headings will please notify the publishers. Such omissions are accidental, not intentional.

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——See also Mill Supplies.

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Fiedt, Geo. D. & Co.
Grasselli Chemical Co.
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Taunton, New Bedford Copper Co.

Coppersmiths.
Beer, Paul.
Badger, E. B. & Sons Co.

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Charles, W. B.
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Crompton-Thayer Loom Co.
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Curtis & Marble Machine Co.
Draper Company.
Easton-Burnham Co.
Elliott & Hall.
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Firth, William, Co.
Houghton, L. T.
Howard & Bullough American Mach. Co.
Kilburn, Lincoln & Co.
Kitson Machine Co.
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Lowe, Stephen C.
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Mason Machine Works.
Metallic Drawing Roll Co., The.
North Chelmsford Machine Co.
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Philadelphia Textile Machinery Co.
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Schofield, Geo. L.
Smith, Jas., Woolen Machinery Co.
Stoddard, Haserick, Richards & Co.
Textile Finishing Machinery Co.
Vacuum Dyeing Machine Co.
Whitin Machine Works.
Woonsocket Machine & Press Co.

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Howard & Bullough American Mach. Co.
Kitson Machine Co.
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Stoddard, Haserick, Richards & Co.

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Bosson & Lane.

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Blaisdell, S., Jr., Co.
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Dixon, Jos., Crucible Co.
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Kennedy, Thos. (Cutters, etc.).

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Dextrine.
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Kenyon, D. R. & Son.
Mass. Fan Co.
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Philadelphia Textile Machinery Co.
Power Specialty Co.
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Whittle, Jas. H.

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Bull, William C.
Pearson, J. T.

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Hartford Blower Co.
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Bosson & Lane.
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Dillon & Co.
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Kalle & Co.
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Ford, J. B., Co.
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Geigy Aniline & Extract Co.
Geisenheimer & Co.
Holliday & Sons, Ltd.
Johnson, Chas. A. & Co.
Kuttroff, Pickhardt & Co.
Leyland, Thos. & Co.
Metz, H. A. & Co.
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Roessler & Hasslacher Chemical Co.
Schoen & Schlichter.
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Vila, H. S.

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Bullock Electric Mfg. Co.
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Mechanical Appliance Co.
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Allis Chalmers Company.
Bullock Electric Mfg. Co.
General Electric Co.
Mechanical Appliance Co.
Westinghouse Electric & Mfg. Co.

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Buffalo Forge Co.
Bullock Electric Mfg. Co.
General Electric Co.
Hartford Blower Co.
Mass. Fan Co.
Mechanical Appliance Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Sturtevant, B. F., Co.
Westinghouse Electric & Mfg. Co.

Electric Lamps.
Sterling Electric Mfg. Co.

Electric Lighting.
Allis Chalmers Company.
Bullock Electric Mfg. Co.
General Electric Co.
Westinghouse Electric & Mfg. Co.

Electric Motors.
Allis Chalmers Company.
Bullock Electric Mfg. Co.
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Exhaust Heads.
Burt Manufacturing Co.
Pittsburgh Gage & Supply Co.
Sturtevant, B. F., Co.

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Feed Water Heaters.
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Roberts Filter Co.
Scaife, W. B. & Sons.

Feed Water Pumps.
Gould's Mfg. Co.
Pittsburgh Gage & Supply Co.
Scaife, W. B. & Sons.

Feed Water Purifiers.
Philadelphia Water Purification Co.

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Phila. Water Purification Co., The.
Pittsburgh Gage & Supply Co.
Roberts Filter Co.
Scaife, W. B. & Sons.

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Eureka Fire Hose Co.

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Increase Your Production

Your employees will turn out more work when they have good air to breathe with ample heat in winter and proper ventilation in summer

Use the

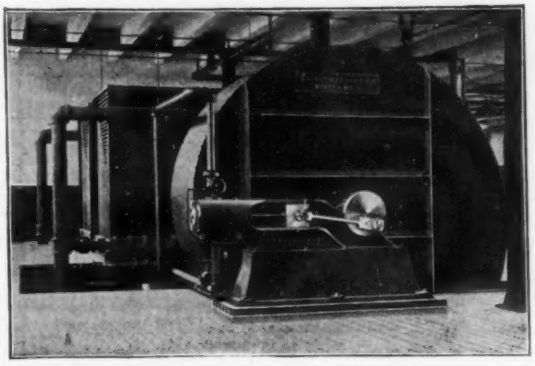
Sturtevant System

of

HEATING and VENTILATION

A centralized plant under one man's control.

No scattered steam piping, no hammering of steam pipes, no leaky joints.



A forced circulation of air by means of a fan.

Operation independent of weather.

Exhaust steam utilized.

B. F. STURTEVANT CO.

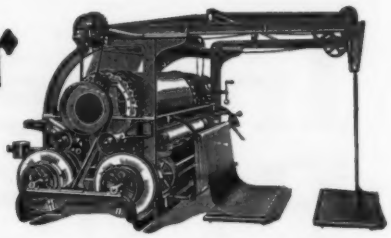
Hyde Park, Mass.

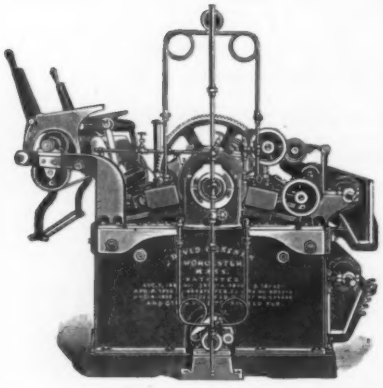
BOSTON NEW YORK PHILADELPHIA CHICAGO LONDON

348

David Gessner

Worcester, Mass.

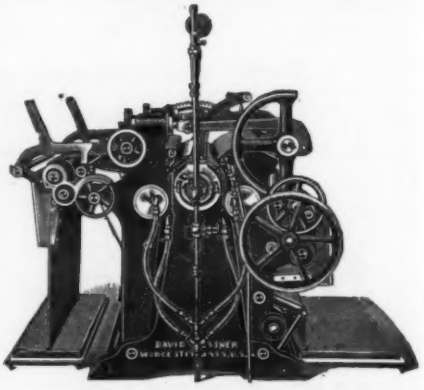




Latest Improved Cloth Finishing Machinery

—

Napping Machines and Presses a Specialty



Fire Hydrants.
Norwood Engineering Co.

Fire Proof Doors and Windows.
Lupton's, David, Sons Co.

Flax, Tow, Hemp and Jute Machinery.
Haskell-Dawes Mach. Co.
Lawson, Samuel & Sons.
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The New

Crompton-Thayer Loom Company

.. MANUFACTURERS OF ..

FANCY LOOMS

For Weaving Worsted and Woolen, Fancy Cottons and Silk Fabrics.

Dobbies, Box Motions and Supplies.

WORKS AND OFFICES:

677 Cambridge Street, Worcester, Mass.

Measuring and Folding Machines.
Elliott & Hall.
Fabric Measuring & Packaging Co.

Mechanical Draft.
American Blower Co.
Boston Blower Co.
Buffalo Forge Co.
Massachusetts Fan Co.
Sturtevant, B. F., Co.

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Buffalo Forge Co.
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Suck, Adolph.

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Lorrimer, Wm. H., Sons Co.
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Crosby Steam Gage and Valve Co.
Dixon Lubricating Saddle Co.
Easton-Burnham Co.
Eureka Fire Hose Co.
Garland Mfg. Co.
Houghton, E. F., Co.

Injectors.
Lunkenheimer Co.

Ironing Machines for Knit Goods.
Craw, J. W., Laundry Machinery Co.

Jacquards.
Halton's, Thomas, Sons.

Knit Goods, Edgings, Trimmings, Etc.
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Hepner & Horwitz.
Krout & Fite Mfg. Co.
Weimar Bros.

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Johnson Novelty & Mill Supply Co.
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Putnam & Co.

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Merrow Machine Co.
Willcox & Gibbs Sewing Machine Co.

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Hunter, Jas., Machine Co.
Jeffrey Manufacturing Co.
Kilburn, Lincoln & Co.
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Philadelphia Drying Machinery Co.
Reeves Pulley Co.
Saginaw Manufacturing Co.
Schofield, Wm., Co.
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Spence & Rideout.
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Mason Regulator Co.
Walworth Mfg. Co.

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Goulds Mfg. Co.
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Mason Regulator Co.
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Norwood Engineering Co.
Philadelphia Water Purification Co.
Roberts Filter Co.
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North Chelmsford Machine Co.
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Philadelphia Textile Machinery Co.
Schofield, Wm., Co.
Smith, Jas., Woolen Machinery Co.

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Tierney, Frank A.

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New Process Raw Hide Co.

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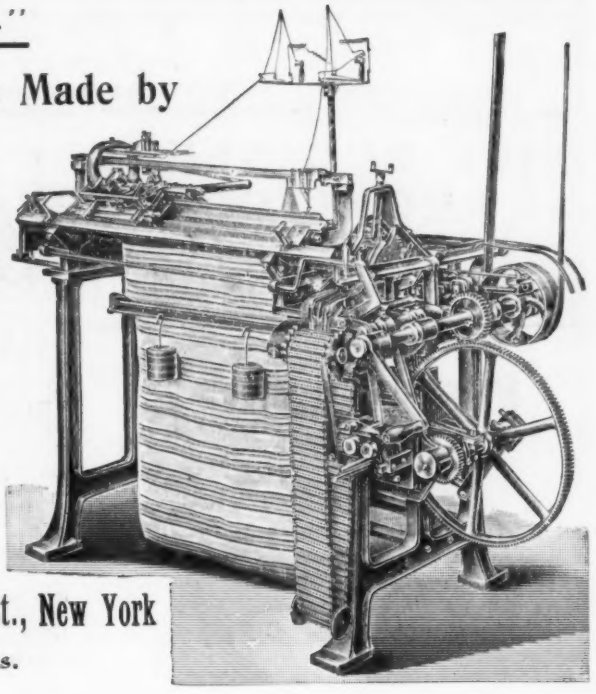

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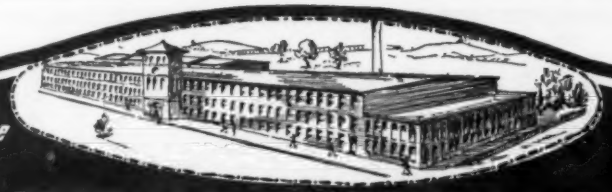

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Superintendent. American; married. Worked on cassimeres, dress goods, cotton warps, and has had some experience on worsteds. Will go anywhere, but would like a good Western mill. Good experience. 3034, Textile World Record.

Superintendent, manager or designer. Age 37; English; married. Worsted and woolen goods for men's wear and rain cloths. Worked in English mills, and has also been employed in this country. 3103, Textile World Record.

Superintendent, age 34; American; married. Worked on fancy woolens. Not employed, and can take position at once. Will not go to Canada or West or South. Would take a good boss spinner place or assistant superintendent, but wants over $4.00 per day. 3104, Textile World Record.

Superintendent or designer of small or medium sized mill. All kinds of fancy worsteds, cassimeres, cheviots, overcoatings and dress goods. Age 31; married; Scotch. 3076, Textile World Record.

Asst. Superintendent or Overseer. 20 years' experience as overseer in both England and Scotland over combing, drawing, spinning, etc. Can work both long and short wools, get up all kinds of mixtures, instruct the shading of batches, etc. Has good references. 43 years of age. 3086, Textile World Record.

Superintendent or Designer. Age 37; American; married. All grades of woolens and also cotton warp goods. Will not go South or to Canada. 3124, Textile World Record.

Superintendent or boss weaver. 15 years' experience in worsted, woolen and silk goods. Graduate of Philadelphia Textile School. 32 years old; married. Good manager of help. American. 3119, Textile World Record.

Superintendent. Age 37; American; married. Woolen dress goods, fancy cassimeres, cloakings, etc. Will not go West, South or to Canada. First-class references. Graduate of Philadelphia Textile School, and also had good practical experience. 3126, Textile World Record.

COTTON CARDERS.

Carder in Cotton Mill. Coarse or fine, white or colored, hosiery, Egyptian, etc. Age 35; Canadian; married. 3029, Textile World Record.

Overseer of Carding. Large experience on all kinds of work and both English and American systems. Can furnish first-class references. Had charge of carding in some of the best New England mills. 3009, Textile World Record.

Overseer of Carding or cotton ring spinning. Worked on carded and combed Peelers, Egyptian, and Sea Island cottons, making yarns from 8 to 80. 3015, Textile World Record.

Overseer of Card Room. Had good experience in carding, and is an expert in the manufacture of combed yarns from the bale to the finished article. Good references. Wants no less than $18 per week, and will no go South or to Canada. 1745, Textile World Record.

Overseer of Carding. Has held all positions in picker and card rooms. White and colored goods, 5s to 40s. 3070, Textile World Record.

Overseer of Carding Mill. All kinds of fine yarns. Started up two of the largest card rooms in New England. Considered an expert in the manufacture of combed yarns from the bale to the finished article. First-class recommendations. 1745, Textile World Rcord.

Overseer of Cotton Carding. Worked on all classes of cotton, carded and combed, in counts to 135s. Will not go West or South. 3061, Textile World Record.

Overseer of Carding or Ring Spinning. Age 35; American. Sheetings, prin s and yarns, coarse and fine. Worked on most American machinery, but is more familiar with Lowell & Whitin. 1915, Textile World Record.

Overseer of Carding or Superintendent. Wide experience in large mills. Age 42; married. Finest of references. Will take large carding or superintendency. Familiar with all counts. 3133, Textile World Record.

Overseer Cotton Carding. Age 35; married; 12 years' experience as overseer. Worked on all kinds of yarns from 10's to 150's, combed and carded, and is familiar with all makes of English and American machinery. 2075, Textile World Record.

WOOLEN CARDERS.

Overseer for Washing, Carding or Combing wool for worsted wants to better himself. Speaks German, French and English. Best of references. 2033, Textile World Record.

Carder, or carder and spinner. German; married. Worked on all wool, wool and cotton, and shoddy mixes. Ten years' actual experience, and can furnish first-class recommendations. 2057, Textile World Record.

Overseer of Woolen Carding. Worked on all wool, wool and shoddy, wool, shoddy and noils. Wants $4 a day. Familiar with Davis & Furber, Furbush, Lombard and Bollette and Brown Patent. 3071, Textile World Record.

Overseer of Combing, washing, carding. Age 36, English, married. All classes of wool. Good experience and first-class recommendation. 3094, Textile World Record.

Overseer of Woolen Carding. Would accept secondhand position. All wool, cotton and wool, shoddies, mixes, worsteds. Does not wish for position on shoddy, but would consider one. Blankets, suitings, flannels. Understands spinning. 3093, Textile World Record.

Carder and Spinner. Been overseer 32 years, making every variety of cassimere, flannels, overcoatings, cloakings, dress goods, etc. Married; American. 3132, Textile World Record.

COTTON SPINNERS.

Overseer of Mule Spinning who has had a wide experience in large New England mills on yarns ranging from 24's to 160's is open to a position. 37 years old; American. Good references. 2003, Textile World Record.

Overseer Ring Spinning, or asst. superintendent. Sea Island combed from 6s to 30s, American from 6s to 50s; in fact, all grades of cotton, also expert on cable yarn. Prefers South, but will go anywhere. Wants $3.50 per day to begin with. 2020, Textile World Record.

Overseer of ring spinning, spooling, warping and dressing. Will not go South. Middle aged; American; married. Good experience and references. 3059, Textile World Record.

Boss Ring or Mule Spinner. Age 43; English; married. Asa Lee mules, Lowell Machine Shop, Platt, Mason mules; Howard & Bullough, Lowell and Mason frames. Yarns from 5's to 90's. 3001, Textile World Record.

Overseer of Cotton Mule Spinning. Understands Mason and English makes of mules. Has worked in mule room sixteen years, five years as second hand and a year and a half as overseer. 28 years old; married; steady and temperate. Would like to get work in N. E. or New York states. Has worked on colored hosiery yarn and filling. 1822, Textile World Record.

Overseer of Ring Spinning. Aged 42; American; married. Ginghams, sheetings, awnings, denims, etc.; $3 to $4 per day. 3018, Textile World Record.

Secondhand Spinner. Held positions of charge of cone and tube winding and spooling, also section of spinning frames. Cotton yarns 8's to 100's on twisters, spoolers, winders, warpers. 3030, Textile World Record.

Supt. of Cotton Mill, or overseer of mule or ring spinning is open to a position; 16 years' experience in Northern mills, on yarns, denims, awnings, apron checks, bicycle suitings, shirtings, etc., etc. Familiar with all well-known makes of cotton machinery; 29 years old; American; married. Can give references from large Massachusetts mills. 1527, Textile World Record.

Overseer of Cone Winding and spooling or ring spinning, who understands Universal, Foster, Broadbent and Payne winders, and Whitin and Mason frames, desires a position. Has worked on carded and combed yarns from 4's to 160's; also, mercerized, gassed and bleached yarns from 2 to 8 ply. Young man; American; married, and can give satisfactory references from large mills. 1960, Textile World Record.

Overseer of Spooling, warping, beaming, slashing and web drawing. Age 37; married. 3010, Textile World Record.

Overseer of Spinning. Age 34; married. Good experience. 20s to 90s Egyptian and American cotton. 3125, Textile World Record.

WOOLEN SPINNERS.

Roll Coverer wants an opening for work. Can cover cotton or worsted rolls, make aprons, or better, has had large experience. Can furnish tools. Work by piece or day. 1803, Textile World Record.

Boss Spinner. Age 34; Scotch. Worked on all wool, cotton and wool and shoddy mixes. Will not go West, South or to Canada. References. Good experience. 3032, Textile World Record.

Overseer of Warping, Spooling and Winding. Dress goods and cloth. Will not go to Canada. Aged 40; married. Good experience. References. 2027, Textile World Record.

Beamer. Young man, twenty-three years old, first-class, desires position, is also fairly good twister, weaver and warper. No objection to distance. Address John Cyrie Clarkson, 1326 Sellers Street, Frankford, Penn.

COTTON WEAVERS.

Overseer of Weaving or designer. Lawns, sheetings, twills, sateens, quilts, bedford cords, lappets. A young man; unmarried. Good experience and first-class recomendation. 3063, Textile World Record.

Overseer of Weaving. Englishman; 33 years of age; married. Worked on fine lawns, sheetings, sateens and fancies, coarse drills, twills, bicycle cloth, automobile cloth for tires. Familiar with Whitin, Crompton, Knowles, Mason, Kilburn & Lincoln and Lowell machines. 3073, Textile World Record.

Overseer of Weaving. Accustomed to fancies. Can do own designing and figuring. Good references from past employers. Is open to go anywhere. Had experience on many kinds of looms, including the Draper. 1731, Textile World Record.

Overseer of Weaving. Sheetings, sateens, ginghams, and dimities. Will not go South. 3116, Textile World Record.

Overseer of Weaving wants position. Practical experience from weaver, loom fixer, secondhand to overseer, on all kinds of looms and make of goods. References. Good manager of help. Married man; 35 years of age. 1806, Textile world Record

Overseer of Weaving. Age 35; Scotch; married. Good experience, and excellent references, Crompton, Whitin, Lowell, Colvin, Woonsocket and English looms. Sheetings, lawns, ginghams, flannels, fine worsteds, dress goods, shirtings and novelty goods. 2016, Textile World Record.

Practical Boss Weaver and loom fixer wants position. Good and long experience. Good record for big production; good quality and for being a good manager of help, and the getting and keeping plenty of good hands. A sober and steady man. Will go anywhere. Either cotton, woolen or jute. 1806, Textile World Record.

WOOLEN WEAVERS.

Overseer of Weaving, also designer. Men's wear, woolen and worsted, and fancies of all kinds, cotton worsteds, dress goods. Knowles and Crompton looms. Age 35. 3056, Textile World Record.

Overseer of Weaving, or would take good second hand job. Age 42; married. Worked on dress goods, suitings, plaid backs, cloakings, meltons and other classes of goods. Worked on Crompton & Knowles loom. 3016, Textile World Record.

Boss Weaver or assistant superintendent. Worked on all kinds of worsteds and woolens. Crompton & Knowles looms. Wants place at once. Middle aged; English; married. Good experience. Excellent references. 3062, Textile World Record.

Boss Weaver. Aged 38; married. Cassimeres, beavers, kerseys, dress goods, flannels, blankets. Worked on Crompton & Knowles broad looms. Good recommendation. 3066, Textile World Record

Overseer of Woolen Weaving, or would take a secondhand job. 35 years old; married. Familiar with Crompton & Knowles looms. Good references. 3089, Textile World Record.

Overseer of Weaving or designer. Age 29; American; married. Thibets, meltons, kerseys, worsteds and cotton worsteds. Crompton & Knowles looms. Good experience. First class recommendation. 2051, Textile World Record.

Superintendent of Weaving. Englishman; married. Worked on fancy worsted and cotton dress goods and men's wear. First-class recommendations. 3111, Textile World Record.

Boss Weaver wants position. Very wide experience. White and colored, plain and fancy. Understands all kinds of looms. 335, Textile World Record.

DYERS.

Boss Dyer. Scotch; married. Wool, worsted, carpet and cotton yarn, piece goods, dress goods, raw stock. Will not go West, South or to Canada. Wants $3.50 or over. 3082, Textile World Record.

Dyer, bleacher and washer. Age 30; American; married. Cotton print goods in either the roll or garment, long and short hose, raw stock and yarn, aniline or oxidized black on hosiery. Good references. 3081, Textile World Record.

Dyer. Secondhand or overseer of small place. Single, steady man; 25 years old. Has had six years' experience on raw wool, cotton, yarn, shoddies and piece dyes. 3101, Textile World Record.

Dyer and Bleacher in black and colors. Age 36; married; Swiss. Cotton hosiery and yarn. 3051, Textile World Record.

Dyer or superintendent of dyeing and finishing. Age 34; English; married. Not less than $3.50 per day. All classes of woolen, worsted, mixed and cotton piece goods, bleaching, mercerizing. Can take charge from loom to case. 3121, Textile World Record.

Boss Dyer. A young man; married; American. Worked on wool, shoddy, cotton, silk noils, rags, camel's hair and piece dyes on satinets. Will accept $2 per day to start. 3122, Textile World Record.

Boss Dyer, mercerizer or bleacher. Scotch, married. Wool, yarns, piece, cotton and slubbing. Can take place at once. First-class recommendations. Familiar with all the latest improved machinery in the dyeing business. 3097, Textile World Record.

Boss Dyer. Twenty-six years' experience in all in woolen mills, 22 years being an overseer. Middle aged; American; married. Will not go South or to Canada. 3134, Textile World Record.

Dyer on cotton and woolen piece goods, yarn and fast black on cotton. Age 42; married. 3021, Textile World Record.

FINISHERS.

Finisher, both wet and dry. Age 28; English; married. Shirtings, ginghams, cotton dress goods, mercerized effects and men's cotton suitings and trouserings. Excellent references. 3007, Textile World Record.

Boss Finisher. American. Cheviots, cassimeres, beavers, dress goods, etc. Wants $2.50 to $3 per day. 3123, Textile World Record.

Woolen Finisher. Age 35; American; married; Wants $2.50 or $3.00 per day. Good experience. 3138, Textile World Record.

Overseer of Finishing, worsted goods, white or fancy. A young man; married; English. Has had full charge of piece dye finishing. 3019, Textile World Record.

Boss Finisher. Worked on broad cloth, cheviots, kerseys, coverts, meltons, piece dyes, dress goods. Prefers Massachusetts, but will go anywhere in New England. Not employed and wants place at once. Young man; American. 3046, Textile World Record.

Boss Finisher in a woolen mill. Worked on kerseys, meltons, cassimeres, satinets, cheviots, etc. Wants $3.50 per day. Will not go to Canada or West. 3077, Textile World Record.

Overseer of Cloth Room. Age 37; American; married. Wants $18 per week or over. 3110, Textile World Record.

Overseer of Finishing. Age 33; American; married. Meltons, coverts, cheviots, flannels, mohairs, etc. Wants position in New England, preferably Rhode Island. 3129, Textile World Record, Boston.

KNITTERS.

Knitter. Worked on light and heavy weight ladies' ribbed vests and shaped vests, and all kinds of common knit goods. Familiar with Champion, Nye & Tredick, Star, McMichael & Wildman machines. Wants work in Pennsylvania. 3037, Textile World Record.

Superintendent or Machinist. Age 36; English; married. Worked on underwear, ribbed and plain; sweaters, circular and flat; hosiery, circular and full fashioned. Will not go West or South. First-class recommendation. 3095, Textile World Record.

Knitter. Worked on light and heavy weight ladies' ribbed vests and shaped vests, and all kinds of common knit goods. Familiar with Champion, Nye & Tredick, Star, McMichael & Wildman machines. Wants work in Pennsylvania or Western States. 3037, Textile World Record.

Superintendent knitting mill. Cotton and wool hosiery, heavy mittens, sweaters, toques. Good experience. Aged 45; married. 1291, Textile World Record.

Superintendent Hosiery Mill. Age 22; American; single. Worked on 84 needle goods. Prefers position in the South. 3033, Textile World Record.

Boss Knitter or second hand. Silk, worsted, lisle, cotton and mixed yarns. Is familiar with any latch needle machine. 1819, Textile World Record.

General Manager or superintendent of ribbed underwear mill. American; married. Been in underwear business eleven years as superintendent and manager. First-class references as to character and ability. 3100, Textile World Record.

Latch Needle Knitter on N. & T., S. & H., S. & W., McM. & W., Pepper, Lewis Jones, etc., circular machines. Twelve years' experience as boss knitter and superintendent. Wants steady work. Sober, good manager of help, best of references. 3106, Textile World Record.

Boss Knitter or fixer. Would like to work with boss finisher on sewing machines. American; age 32. Familiar with McMichael & Wildman, Nye & Tredick, Snyder & Fisher, Scott & Williams and other makes of latch needle machines. Tompkins spring needle machines, and understands winding. 3118, Textile World Record.

Overseer Boarding and finishing hosiery. All kinds of men's, women's and children's hosiery, except silk. Age 41; American; married. Can furnish references. 3035, Textile World Record.

Superintendent of knitting mill, or foreman in large plant, is open to position. Had some 15 years' experience as machinist, foreman and superintendent. Familiar with all grades seamless hosiery and most makes of seamless hosiery machinery. Understands business from starting new mills to finish. Perfectly sober and reliable. 3078, Textile World Record.

Position wanted in charge of boarding, pressing, pairing, folding of hosiery, etc. First-class references. 3105, Textile World Record.

Superintendent of a 200 dozen hosiery or assistant of large hosiery. Thoroughly understands the technical and practical parts of machinery and manufacture. Young man. Fine references. 3137, Textile World Record.

Boss Knitter or Sewing Machine Fixer. German; married. Familiar with all makes of knitting and finishing machines on ladies' underwear. Will not go South or to Canada. 3128, Textile World Record.

Superintendent, or Partnership. Wants Western States, Canada, or Pennsylvania. Familiar with nearly all makes of circular hosiery machines. An American; married. 3131, Textile World Record.

Knitting Fixer. A young man; American. Ribbed and seamless hosiery, cotton, lisle and Egyptian yarns. Familiar with McMichael & Wildman ribbers, Paxton & O'Neill and Branson 3/4 automatic and Hepworth loopers. Will not go South. 3130, Textile World Record.

Asst. Superintendent or Boss Knitter. Age 29 strictly temperate and held position of boss knitter for past four years running. Fleeces, balbriggan and flat work on spring needles, and plaited straight and shaped work on several makes of latch needles. Can give best of references. 1492, Textile World Record.

DESIGNERS.

Designer or Asst. Age 28; unmarried. Men's wear, woolens and worsteds. Prefers New England States. Thoroughly posted technically in all points, good on colors, calculations, etc. 3099, Textile World Record.

Designer. A young man who has had eight years of practical experience in cotton designing wants position as designer or boss weaver. Worked on Marseilles, crochet and satin bed spreads, table covers, ginghams of all kinds, including leno, lappet and all classes of the above. Jacquard work a specialty. 3107, Textile World Record.

Designer. Plain satin, fancy leno, checks, colored and dainties in cotton. Wants $3.50 or over a day. 3043, Textile World Record.

Designer, or assistant superintendent and designer. An A1 color designer. Can get up good line of fancy woolen and worsted goods which will be good sellers and profitable to the manufacturer. Graduate of a prominent designing and textile school in Germany. Is well posted on all kinds of stock, cotton and shoddy, and with the general work of a woolen mill. 1789, Textile World Record.

Asst. Superintendent or Designer. Familiar with men's wear, overcoatings and fancy worsteds. A young man. Taken post graduate course at Yorkshire College, Leeds, England. Attended Philadelphia Textile School a year and graduated from Lowell Textile School. Bright and of good character and habits. 3096, Textile World Record.

Designer or assistant. Worked on woolen and worsteds, cotton worsteds and mercerized goods. Good experience. A young man, single, Swede. 3127, Textile World Record.

MISCELLANEOUS.

Asst. Superintendent of dyeing, printing and finishing plant. Experienced in cotton and silk and capable of turning out finished product. American; 27 and married. Best of references. 3136, Textile World Record.

Second Boss or in advisory capacity for jacquard weaving. Familiar with almost every line of silk fabrics, also cotton backs, tapestry and upholstery goods, hammocks, table and bed covers, ribbons, etc. 3135, Textile World Record.

Fixer of sewing machines. Is familiar with machinery of all kinds that is used in making up and finishing knit underwear. Will not go West or South. Wants place at once. References. 3068, Textile World Record.

Loom Fixer or boss weaver. American. Familiar with all kinds of looms. Can take place at once. A good, steady man, and thoroughly reliable. 3091, Textile World Record.

Machinist. French; married. Has had full charge of all kinds of repairing. Understands all about boilers, engines, motors and can give best of references. 3090, Textile World Record.

Traveling position with mill supply house. Has been dyer, but mill now closed. 3108, Textile World Record.

Overseer or second hand's position. Understands twisting, warping, spooling and cone winding. Worked on all kinds of cotton yarns. Will not go West or South. 3112, Textile World Record.

Machinist on Leighton circular machines. Worked on sweaters and jacket. 2026, Textile World Record.

Master Mechanic in cotton mill. Wants $1,500 to $2,500 per year, according to duties and position. Can take place at once. Will not go to Western States or Canada. Familiar with steam engines, pumps, boilers, water wheels and complete cotton mill equipment. 3039, Textile World Record.

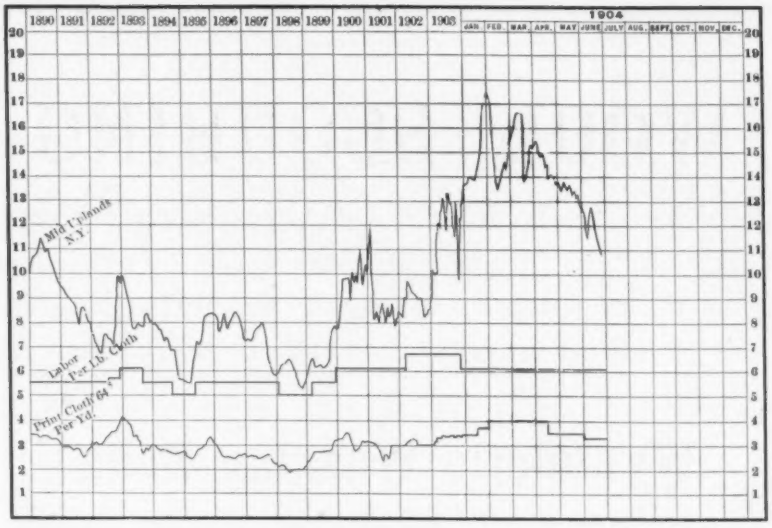
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CHART SHOWING RANGE IN THE PRICE OF COTTON TO DATE.

The Cotton Market.

Wide fluctuations between 13¼ and 11 cents have occurred in the cotton market since our last report. These variations in the price of spot cotton have been in sympathy with the market for futures which is influenced by the favorable outlook for a larger crop. Actual spot business has been small and the low prices now prevailing do not represent a corresponding shrinkage in the value of the cotton in stock. They have been brought about by the abnormal conditions now prevailing. The curtailment of production in the mills throughout the world is estimated at fully one quarter of the total capacity. This inaction has been brought about by the scarcity of cotton and is proof that the mills possess very small stocks of raw material. The old crop has been marketed and nearly all of it is owned by the spinners. The following table shows the cotton that has come in sight and been taken by spinners from Sept. 1 to June 24, for each of the past six seasons, as reported by the Chronicle:

1903-04	9,789,888 bales.
1902-03	10,410,440 bales.
1901-02	10,042,628 bales.
1900-01	9,902,381 bales.
1899-00	8,812,195 bales.
1898-99	10,898,373 bales.

The above exhibit shows that practically all the old crop is marketed at this time of the year. It also shows that the record breaking high prices of the past season have brought less cotton in sight than in any season since 1899-00. In 1899 the South had been impoverished by 6-cent cotton for several years and eagerly sold all that could be raked and scraped together at 8 cents. This seemed a high price in comparison with 5 cents in 1898, and accounts for the large movement to market in 1899-00.

Times have changed since then and cotton prices have risen to an American level. The South has since been enriched by selling its cotton for two seasons at 12 to 16 cents per pound. This change will have great influence on the cotton market of the future. Today all but a small part of the 1903-04 crop has been sold. The 1904-05 crop is growing. Brokers on the cotton exchanges may mark prices up or down, buy and sell cotton that is not yet picked, but the real business will begin only after the new cotton has been picked, ginned and baled. Reports from the cotton fields are favorable for a large yield. The Chronicle reports the world's visible supply June 24, 1904, at 2,172,234 bales; as compared with 2,347,198 bales in 1903, 2,509,053 bales in 1902 and 2,832,908 bales in 1901. These figures show the strong statistical position of cotton at present.

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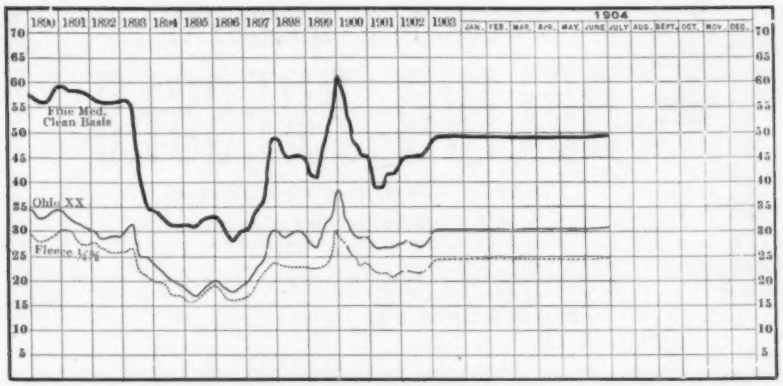

CHART SHOWING RANGES IN THE PRICE OF WOOL TO DATE.

The Wool Market.

High prices in the West and signs of activity in the East have been the features of the past month in the wool market. The keen competition of buyers in the West to secure the new clip has made many dealers and manufacturers fairly gasp for breath, and predictions have been freely made that the leading wool houses which are bidding for new wool are sowing the wind and will reap the inevitable whirlwind.

The increased activity on the seaboard markets has been due to the purchase made by a few large mills. The sales have cleaned up desirable lots of old wool and placed these mills in a position where they can let the high-priced new wool remain in possession of the dealers if business conditions warrant such a course during the rest of the year.

From the wool grower's point of view the situation is unquestionably strong. He is selling his wool in a market whose normal requirements are double the domestic supply, while foreign wool is subject to a substantial duty. This accounts for sales of wool on the sheep's back at prices above the eastern level.

Manufacturers generally are taking the cue from the high prices in the West and the buying by the larger mills, and are in the market covering their requirements for the light weight season, which has opened earlier than usual. Prices for goods have been advanced by the leading mills after the production had been practically sold at the low prices quoted at the opening.

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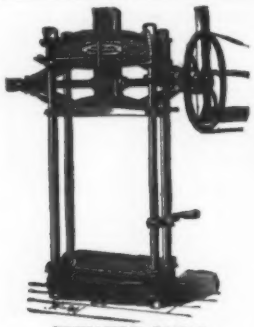

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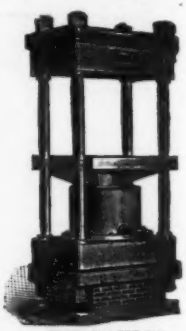

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For Cotton Mills, Warehouses and Factories.

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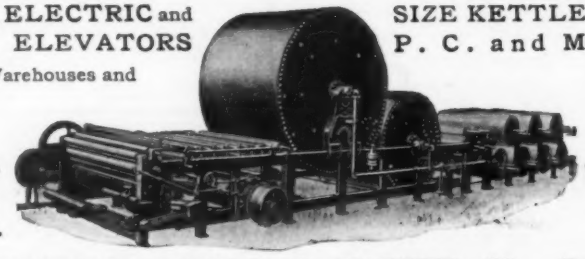

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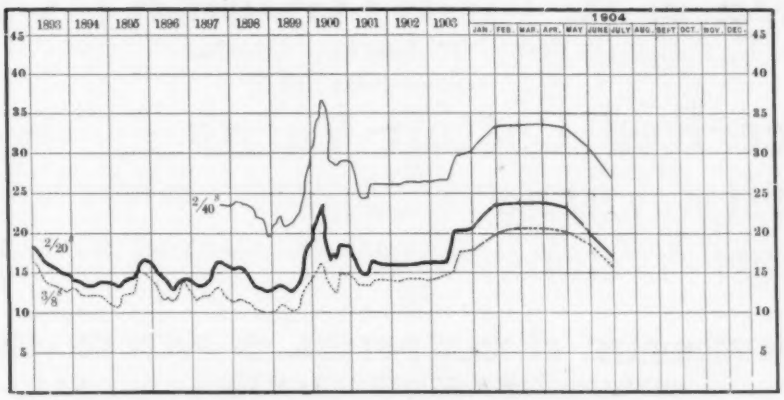

GRAPHIC CHART SHOWING RANGE OF PRICE OF COTTON YARN TO DATE.

Eastern Yarn Market.

Prices for cotton yarn have fallen steadily since our last report. The shrinkage has been due to the anxiety of the spinners to book orders to keep their mills in operation and has been accentuated by the drop in cotton. At the present writing it seems as if the decline had gone below the level warranted by business conditions and that the next development would be a strengthening of values. The spinners claim that in some cases the prices quoted represent an actual loss, but this depends in large measure upon the conditions under which the yarn is manufactured. The cotton in possession of the mills was bought at widely varying prices and the price for yarn that means a loss to one spinner may represent a profit to another.

A fair amount of business has been transacted. There is considerable yarn in stock, although not enough to prove any serious danger. The production of the mills has been in large measure covered by actual contracts and the policy of making yarn for stock that has proved so ruinous in the past is not being followed out at present. Prices are largely nominal. We quote as follows:—

Eastern Cops.

6's	18¼
8's	18½
10's	18¾
14's	19¾
16's	20¼
18's	20¾
20's	21¼
22's	21¾
24's	22¼
26's	22¾
30's	23¾
34's	24½
36's	25½
40's	26½

On cones, ¾c. more up to 14's; 1c. more from 15's to 22's; 1½c. from 23's to 35's, and 2c. above that.

Eastern Two-Ply Skeins, Carded Peeler.

12's	20
14's	20½
18's	21½
20's	22
22's	22½
26's	23
28's	23½
30's	24
36's	26
40's	28
45's	30
50's	32
55's	34
60's	37

Eastern Two-Ply Warps, Carded Peeler.

2/30's	25
2/36's	27
2/40's	29
2/45's	31
2/50's	33
2/60's	37

Egyptian Weaving Yarns.
Single Skeins Combed.

30's	33
35's	34
40's	35
45's	36
50's	40
55's	46
60's	48
70's	52

Two and Three Ply Skeins, Combed.

30's	34
36's	35
40's	36
45's	38
50's	41
55's	45

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Windsor Locks, Conn.

MANUFACTURERS OF

Mercerized Cotton Yarns Gives the High Silk-Like Lustre in Knit Goods and Woven Fabrics.

Novelty Yarns Boucle, Bourette and Spirals, in Cotton, Wool, Worsted, Mohair and Silk.

Cotton Warps on Beams, Jack Spools and Tubes. In Fancy, Twist, Colors and Printed.

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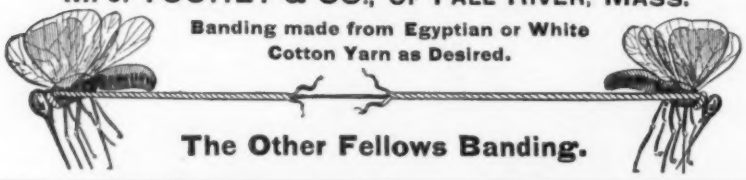
Banding made from Egyptian or White Cotton Yarn as Desired.



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MONUMENT MILLS,

Manufacturers of

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COTTON WARPS

HOUSATONIC, MASS.

4s to 60s.

Dana Warp Mills

WESTBROOK, ... MAINE

White and Colored Warps 6s to 50s Single and Ply

Mule Cops From 30s to 50s from American & Egyptian Cotton

60's	50
70's	55

Carpet Yarns.

60-yd. double reel filling	25-26
No. 2 60-yd. double reel filling	23-24
1st quality 5/8	20½-21
2d quality 5/8	18-18½
60-yd. double reel cotton filling skeins	13
(on cops)	13½
120-yd. single reel cotton (on cops)	13-13½
Wool ingrains, 42-yd. common	6½-7
medium	8
best	10½-11
extra best	11½-12
light supers	15-18
Super jute, 42 yard	6¾-7
Super jute (light), 42 yard	7-7¼
Velvet wool, spun, 135 yds., white	29-30
Gray	28-29

Philadelphia Yarn Market.

The cotton yarn market has continued weak the past month. Prices have softened gradually and are on a lower level today than at any time for nearly a year. Mills have been dull and any orders that have been placed for prompt delivery have been small. Some fair-sized contracts have been placed for fall delivery by the underwear mills, at about the basis of price that ruled last year.

Combed Egyptian and peeler yarns are getting very close to the lowest price at which they ever sold. Yarn is selling today below cost of production on the present price of cotton. It looks as if spinners were unloading their stock of cotton and yarn at the best figures possible, and making a loss in doing so. Prices are about as follows:—

Southern frame cones (good quality:—

7's and coarser	17½
8's and 9's	17¾
10's	18
12's	18½
14's	19
16's	19½
18's	20
20's	20½
22's	21
24's	21½
26's	22
30's	22½
40's	28
50's	32

Southern high grade mule yarn:—

Cones.

10's	10
12's	19½
14's	20
16's	20½
18's	21
20's and 22's	21½-22
24's	22½

Southern frame yarn, lower grades:—

6's and 8's	17
10's	17½

PAULSON, LINKROUM & CO.
Successors to BUCKINGHAM, PAULSON & CO.
Commission Merchants
COTTON YARNS of all Descriptions
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Cash Advances, Cash Sales and Prompt Returns. Consignments and correspondence solicited.

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Brown Building, 185 Summer Street, BOSTON, MASS.

CATLIN & CO.,
Cotton Yarns
345 Broadway, NEW YORK.
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206 Chestnut Street, PHILADELPHIA.
605 Medinah Temple, CHICAGO.

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With FRED'K VIETOR & ACHELIS,
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530 Broadway, - NEW YORK.
MERCERIZED TURKEY RED GASSED } COTTON YARNS.

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COTTON YARNS } ALL NUMBERS
MERCERIZED YARNS } FOR ALL PURPOSES.
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SILK, WORSTED, WOOLEN YARNS COTTON AND MOHAIR
Polished Threads and Tinsel. Artificial or Wood Silk. Mercerized, Turkey-Red, Fine Gassed Yarns.
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CAPACITY, 50,000 Spindles. **ORSWELL MILLS** FITCHBURG, MASS.

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In Chains and Skeins, on Balls, Beams, Spools—Single or Twisted.

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Cotton Warps and Yarns. In Gray and all Colors, Single or Two or more Ply, and Cable Cord.

Novelty Yarns. in Various Patterns, Colors and Twists.

Carded and Colored Cotton. For Mixing with wool, Machined or in Roving.

Indian Orchard, Mass.

E. MORGAN, PRES. H. K. WRIGHT, TREAS. W. C. GODFREY, AGT.

Eastern cones (high grade quality):—

10's	19½
12's	20
14's	21
16's	21½
18's	22
20's and 22's	22½-23

Skein yarn (mostly Southern:—

4's to 8's soft	16
10's to 12's	17
14's to 20's	17-18
22's	18½
14/2	17
16/2	17
20/2	18
30/2	20
40/2	26
16/3 slack	17½
12/3 slack	17
8/3 carpet	16
8/3 slack	16
9/4 slack	16

Warps (mostly Southern):—

10's to 12's	16½
14's	16¾
16's	17
20's to 22's	17½-18
26's	19
14/2	17½
16/2	18
20/2	18½
24/2	19
30/2	20
40/2	27

Mixed colored yarns (mock twist, half colors):—

6's to 10's	19½-20
12's to 14's	20½-21
16's to 18's	22-23

Silver and jaeger, 1½c. over white.

Mock Egyptian, 2c. advance over white.

Egyptian, 4c. to 5c. above best quality white.

Worsted Yarn.

Nearly all the spinners are running on short time, mostly four days per week with reduced machinery. Some orders have been placed for double and twist yarn and also orders have been secured for future delivery. The advance in prices which spinners expect to make inside of thirty days will make the situation more acute. Orders at the old price are being refused, and yarns are advanced from three to five cents per pound. Weavers, however, are not ready to meet the ideas of the spinners and where the advance has been asked the spinner has usually lost business. The most persistent advance is asked on 1/4 to 3/8 Blood yarn. The weavers say they will pay no advance—and the arguments and various talk of the spinner falls on deaf ears so far as the weaver is concerned. They say they are having the condition of the market talked to them, but as they can get no orders for cloth, yarn does not interest them. If weavers have to pay an advance the

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Silkine, also Lisle Silk
FINISH
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Hosiery, Knit Goods, Yarn, Fast Black, Harsh Colors, and Fibres.
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HUGHES FAWCETT, 115 Franklin Street, NEW YORK.
Flax, Hemp and Jute Line and Tow Yarns, For Weaving Purposes.
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Correspondence solicited. Samples promptly furnished.

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COTTON YARNS
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PROVIDENCE, R. I.
Harness and Seine Twines and other Job Gassing, Winding, etc. All Numbers.
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COMBED and CARDED
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Thomas Wolstenho'me Sons & Co.,
MANFRS. OF
ALL NUMBERS
SINGLE AND TWO-PLY,
On Cop or in Skein, for Weaving and Knitting Purposes, in White, Natural and Fancy Mixes.

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YARNS
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Worsted and Mohair Yarns—White or colors, in skeins, on spools, cones, or shuttle bobbins.

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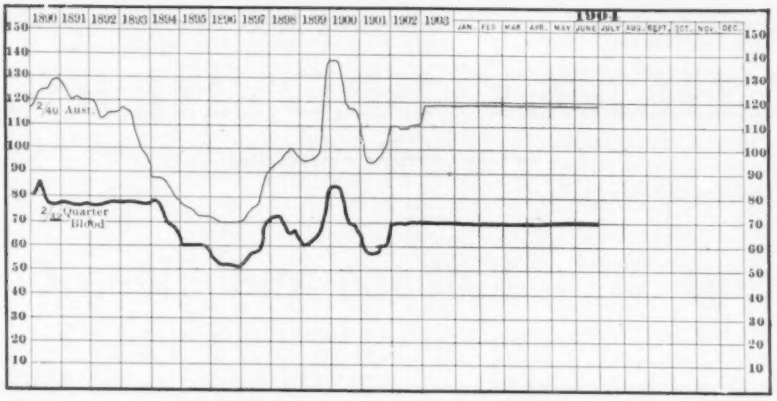

CHART SHOWING RANGES OF PRICE OF WORSTED YARNS.

cloth will be sold at the advance before the order for yarn is placed.

Some of them say they have had enough of speculation and will place no orders until after July 15, and they point to cotton and cotton yarn as the reason they must use caution. They say that those manufacturers who bought cotton yarn last February and March now stand to lose considerable money, as this yarn is much lower by cents than at that time. Therefore they argue:—Those who bought cotton yarn cautiously are in the best position—and those who buy worsted yarn will probably buy cautiously also.

Nevertheless, some weavers have placed orders for half blood yarn in 2/40s for delivery in September and October or as they wanted the yarn. These buyers found many spinners who would take orders at the low set price, but spinners do not like to take orders for future delivery. The only orders being placed are for future delivery and the orders placed early in the season are about run out.

The spinners all point to the condition of the cloth market and the high price of wool as the reason why they are forced to advance prices—quarter blood combing wool has advanced from 22 cents per grease pound to 26½ cents per grease pound, and the spinners say that it is impossible to make this class of yarn without an advance.

They say furthermore that the cloth market is bare of goods and that worsteds are coming again in favor. This is true, but the trend of all worsted cloth is towards cloth requiring half blood yarn, and the quarter and 3/8 blood will be still less in demand by another season. The reason for this is plain enough. Half blood and quarter blood

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In White and Colors.
A. T. SKERRY & CO., 47 Leonard Street, NEW YORK.

MOHAIR LOOPS, KNOTS AND FANCY YARNS FOR DRESS GOODS & CLOAKINGS.

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MOHAIR TOPS AND YARNS FOR WEAVING

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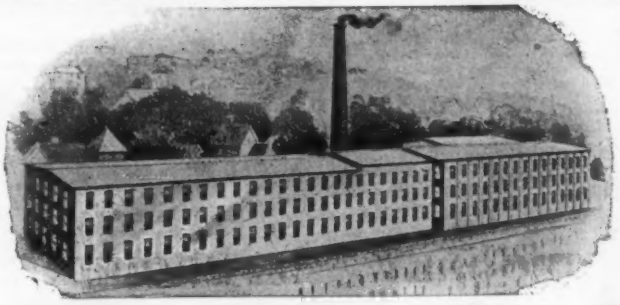

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WORSTED and WOOLEN YARNS,
MERCERIZED COTTON,
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YARNS
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ALSO TOPS.
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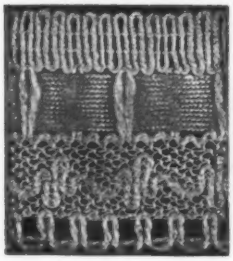

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TAPES Common, Twilled, Superfine and Plain 18 to 35s, white and colors on spools.
YARNS Cops, Skeins, Warps, Tubes and Cones.
THREADS on Spools, Tubes, Cones, Unbleached, Bleached and Colors for Manufacturers' use.
CROCHET LACE EDGINGS Latest Styles in Pant Laces.

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wool are both about the same price, and all weavers of cloth are getting up finer grades and are thus changing styles, trying to induce business by offering better qualities at the same price as the coarser grades. This is true in dress goods as well as men's wear.

The reason the spinners will find it hard to work prices up is because of the uncertainty and all are unwilling to pay an advance. Hence it is that in Rhode Island we find weavers making fancy mix double (requiring double and twist yarn) out of cotton double and twist and selling the cloth in large amounts for 50 cents per yard. Then there are other mills making worsted imitations out of cotton and shoddy. These mills are running over time. It is that class of cloth which is selling and will sell until the wool market becomes settled and thus enable spinners to name prices which are within the reach of the buyers of cloth. That is why we have stated that if the spinners force an advance in yarn at this time, it will be difficult to get, and bring about a deadlock. There are manufacturers who must use fine yarn and who know just what they are going to use, who are uneasy as to values and who want to place orders now for delivery next March. They say that the wool dealers are paying high prices in the West for wool and they will fight hard to get these prices, and consequently when the regular time comes for them to buy in October and November, every wool man who has discounted the future will insist on his "full pound of flesh" with the result that when spinners figure to make yarn, the prices will be beyond the reach of every one.

In meantime business is slack and the looms on the better class of cloth are running poorly. The dress goods manufacturers are getting some business. The knitters using French spun yarn are well stocked and few orders are secured. Combers are mostly employed on the coarser grades of tops. All the speculative tops have been cleaned out of the market, and prices for fine tops are now firmly maintained.

You Save Enough Insurance to Pay for the Equipment.

So it costs you NOTHING to have the AMERICAN WATCHMAN'S CLOCK. Fully approved by all insurance companies. We equip factories with Fire Alarms, Signals, etc., also Employee's Time Recorders, and Telephone Systems. Electric Time System consists of Master Regulator in office with secondary electric clocks throughout the mill, insuring accurate time. Send for particulars.

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Formerly E. JENCKES MFG. CO.

Carded and Combed Cotton Yarns for Weavers and Knitters.

Double and Twist Yarns for Woolen Trade.

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Silesia, Sateens,

For the Underwear Trade.

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YARNS 40's and above. AND **WARPS**

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CENTRAL FALLS, - - R. I.
(DYERS and BLEACHERS) and MANUFACTURERS of
High Class Threads on Tubes, Spools and Cones and MERCERIZED YARNS for Knitting.

GLAZING OF YARNS

For the Shoe Lace, TAPE and WEBBING TRADE.

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Manufacturers of

TWINES, THREADS AND YARNS,

Jacquard Harness Twines of all kind on hand and made to order.

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ANDREW J. SOLIS, Jr. & CO.

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If you do try a sample and don't send us an order afterward, that's our fault—but we have mighty few faults of this nature.

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WOOLEN YARNS,
Carpet Backing and Rug Yarns a Specialty.
ARCOLA MILLS,
Main St., foot of Centre St., Manayunk, Phila.

Knitting and Weaving
YARNS.

Cones, Cops, Warps, Skeins,
Single, Double, Three-Ply, etc.
Peeler, Egyptian, Mixed Colors.
Large Assortment.

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Woolen Yarns
For Weaving and Knitting Purposes.
JAMESTOWN, .. NEW YORK.

Woolen and Merino Yarns,
1 to 10 Runs, at reasonable prices.
All Wool, Mohair and Wool Spun or Mixed Cotton and Shoddy Yarns, in white, gray, and colors.
Dress Goods Yarns a Specialty.
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2/40's Australian	1.20
2/40's XX Delaine	1.10
2/40's Half Blood	1.05
2/20's Half Blood	.85
2/36's ⅜ Blood	.75
2/26's ¼ Blood	.68

Woolen Yarn

The woolen yarn machinery is all well employed so far as the custom weavers are concerned. The work has shifted and many are not working for the same concerns. For instance, during a temporary lull in the receipt of orders a certain large weaver of overcoatings saw fit to cut off much of his outside spinning. At the end of ten days he found orders enough to warrant him again employing his outside spinners. He found, however, that the spinners he had before employed had other orders, and consequently his own looms were stopped temporarily for want of yarn. Some large weaving mills are having much yarn spun outside. This is necessary because of the continued demands for cloth made from woolen spun yarn. One very large weaver who formerly ran his mill entirely on worsted yarn stated that he was running his plant entirely on wool spun yarn made from cotton and shoddy and was producing a good imitation of a fancy mixed worsted cloth. This mill in question is running far into the night and is refusing orders. Asked if he was making money and if he intended to return to straight worsted yarn he made a negative reply to both questions. To the first he said he was getting a new dollar for an old one, and to the second he stated that with wool and worsted yarn advancing, he did not think of it. The people want cheap cloth and the manufacturer must make it.

The spinners of sale yarn have secured some good orders, but in the better makes requiring high-priced stock there has been much disappointment, and while some orders have been placed for yarn out of which to make French flannels, the demand has been but poor in this department. Some spinners trying for top notch prices for merino yarn made from Peruvian cotton have been much disappointed and have lost much business. The contracts for all kinds of sale yarn are becoming reduced. The hosiery manufacturers have started to use merino yarn and low-priced yarn and are fairly busy using up the yarn purchased early in the season.

The dress goods manufacturers are substituting woolen spun yarn for worsted yarn. The knitters of light-weight underwear are running short time, but it is to be expected at this time of the year as the business is over until fall.

The knitters making all wool and heavy garments

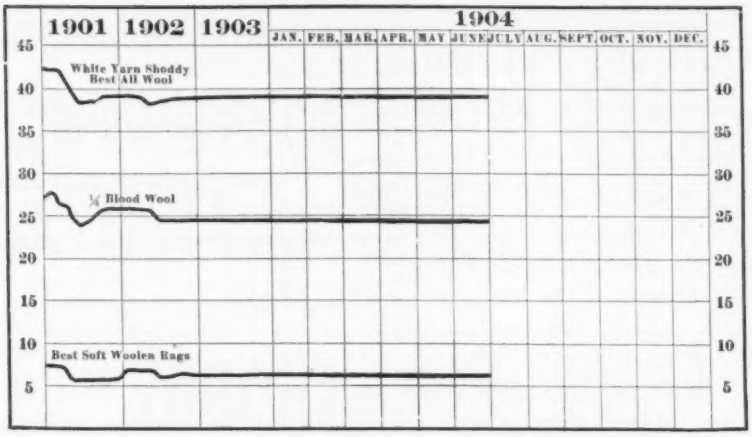

CHART SHOWING RANGE OF PRICES OF SHODDY, RAGS AND NOIL.

are very well employed, but the mills are all lightly stocked both for yarn and wool and do not understand the necessity of the advance in wool and yarn. Some knitters in order to meet prices are lowering the standards of their goods and are using domestic lambs instead of Australian lambs. Australian lamb's wool is scarce and high, and very little has been imported at the high price. The mills buying these lambs later will find but a poor selection and at high prices—78 to 82 cents per pound for good lambs. Domestic thread waste of all kinds is very scarce, caused by the worsted spinners being on short time. There will be much foreign thread used during the next season. This thread is being sold for 60 to 62 cents per pound. Silk waste is also in demand, and there is much of this being imported.

The hosiery manufacturers are all busy. The knitters of heavy-weight underwear are busy. Manufacturers of all classes of cheap shoddy and cotton cloth, both for ladies' and men's wear are all busy.

The Rag and Shoddy Market.

The light weight season has increased the dullness at this market. Manufacturers of shoddy are running slack as the mills are on goods that require but a small quantity of wool substitutes. The rag market is in a corresponding state of dullness. In spite of these conditions prices are well maintained, doubtless owing to the conviction on the part of dealers that a reduction of prices would not lead to any material increase in business. Rags are coming on the market in small volume, and this is the reason why the lack of demand is not accompanied by any increase in stock on hand. Collectors are making the supply meet the demand, an adjustment that can be easily made where the material is a refuse product.

The strength of the wool market is an encouraging feature and, if maintained, cannot fail to bring about an improved demand for wool substitutes.

SHODDIES AND EXTRACTS.

White yarn, best all wool	38-40
White knit, all wool, best, fine	28-32
White knit, No. 2	23-25
Light yarn, extra fine	25-28
New pure indigo blue	23-25
Merino.	
Fine light, all wool, No. 1	24-25
Medium light, all wool, No. 1	16½-17½
Medium light, all wool, No. 2	14-16
Fine black, all wool	20-22
Fine dark, all wool, best grade	20-21
Medium dark, all wool, No. 1	13-15
Medium dark, all wool, No. 2	12-13
Red knit stock, strictly all wool	19-20
Red flannel, all wool	19-20
Dark blue for hosiery, strictly all wool, No. 1	17-20
Dark blue for hosiery, not all wool, No. 2	12-14
DELAINE EXTRACTS.	
Light	19-22
Medium light	15-17

WOOLEN RAGS.

Regular gray	12-13
Black	14-15
Fancy colors	16-20
Fine merchant tailors, all colors	9-11
Choice light colors	13-15
Browns	12-13
Blacks	9½-10½
Fine blues, plain	9-11
Fine dark	10-11
Medium dark	7-8
Worsteds.	
Blue	16-18
Black	18-20
Serges.	
New black	15-16
New blue	14-15

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New scarlet	18½-22
New blue	17-18
Cloakings	3-4

SOFTS AND KNIT STOCK.

Soft woolens, best	7-7½
Old white flannels	14-16
White flannels, No. 2	11-12
Old red flannels	9½-10
Light blue flannels	7½-9
Old blue flannels	6-7
Fine worsted, new black	26
New blue clip, best, fine	20-22
Dark mixed yarn, extra fine	22-24
All wool yarn, medium and coarse grades	15-20
Old plaids	5-7
White stockings	17-18
White hood stock	20-21
Clear hoods	9-10
Red stockings	9-10
Blue stockings	7-8
Fancy stockings, No. 1	7-9
Gray stockings	9-10
Black stockings	9-10
Knit stock comforters	6-7½
Red knit	9-10
Light gray knit	9-10
New light fancies	16-18
New fancies	12-14

Merinos.

Light, fine	13½-15
Light, coarse	7½-8
Fine, dark	12-13
Dark, No. 2	8-9
Coarse dark	5-6
Blue	12-13
Blue-seamed	13-14
Black—unseamed	12-13
New black	18-20
Small	3¼-4
Bunting	6-8

FLOCKS.

Shear, fine white, all wool	9-11
Fine indigo blue, all wool	9-9½
Fine black, and blue, all wool	7-8
Fine dark, all wool	5-6
Gig, fine, all wool	3-4
No. 1, black, all wool cut	6-7
All wool, fancy, shear and gig	2½-3½

NOILS.

Australian	48-50
Fine domestic	38-40
½ Blood	24-28
⅜ Blood	22-23
¼ Blood	17-19
Braid	21-22
Carpet (white)	14-18
Carpet (colored)	10-12½

Seedy.

½ Blood	35-37
⅜ Blood	27-30
¼ Blood	23-26

COTTON WASTE.

No. 1 Spinners	10½-11
No. 1 Machine	7-7½
No. 2 Machine	5½-6¼
Machine Cop	8-8¼
No. 1 Cop	10-10½
No. 1 Card	10-10½
No. 2 Card	9¾-10
No. 1 Oily Card	5-5½
No. 2 Oily Card	4-4½
Egyptian Card	Limited quantity
Peeler Combing	11¼-12
Egyptian Combing	Limited quantity
No. 1 Linters	6-6½
No. 2 Linters	5½-6
White Clips	8¾-9¼
Colored Clips	5½-6½
No. 1 Picker	2-3½

OFFICIAL DIRECTORY of TEXTILE INDUSTRIES

for 1904

The Annual Official Directory for 1904, compiled by the Textile World Record, is now ready for delivery

❧ ❧ ❧

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PART I. Textile Manufacturers.

Textile Establishments of the United States and Canada
Alphabetical Index of all mills in the United States and Canada.
Mills with Worsted Machinery.
Number of Spindles and Looms in the United States.
25 Textile Maps, showing location of cities and towns where there are mills.

PART II. Yarn Index.

List of Yarn Manufacturers, selling their product, arranged under proper headings.
List of Yarn Dealers and Agents.

PART III.

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PART IV.

Dealers in Raw Materials.

PART V.

Agents and Buyers of Textile Fabrics.

PART VI.

A Classified Directory of Textile Machinery and Supplies, including 400 leading concerns.

❧ ❧ ❧

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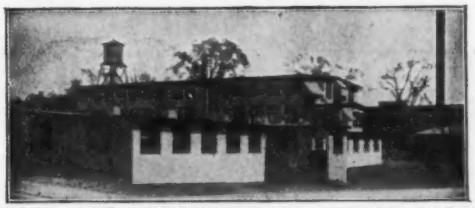

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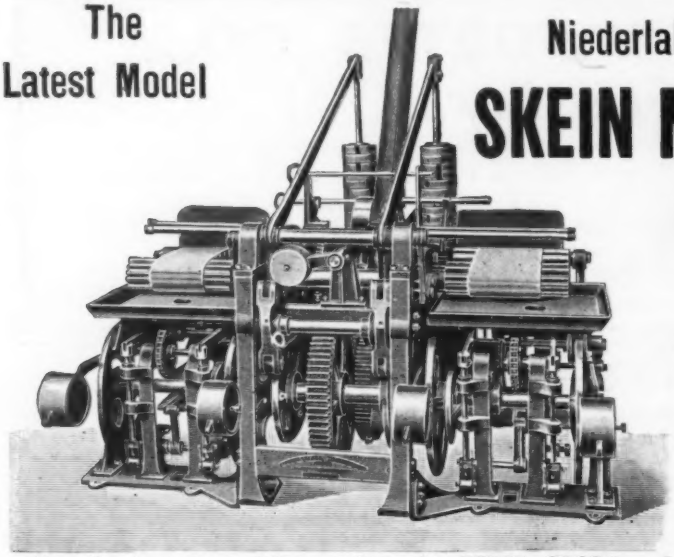

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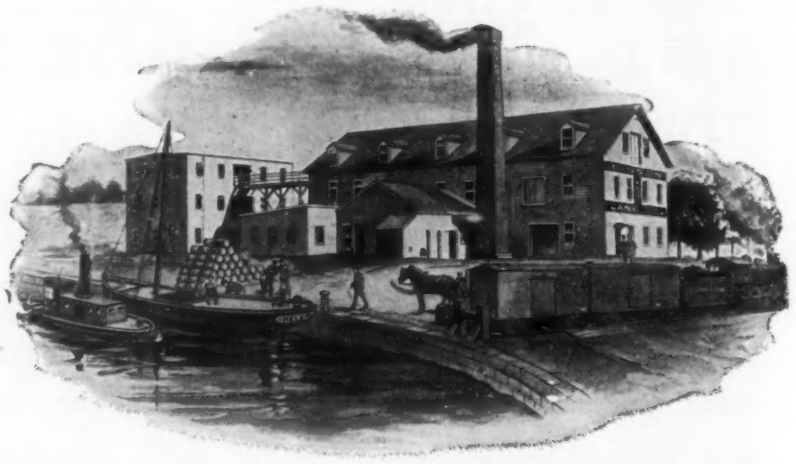

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Correspondence Invited.

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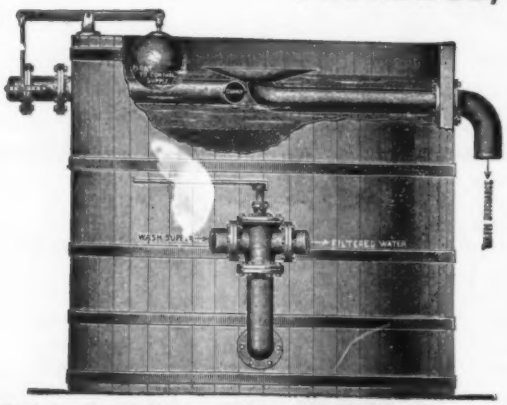

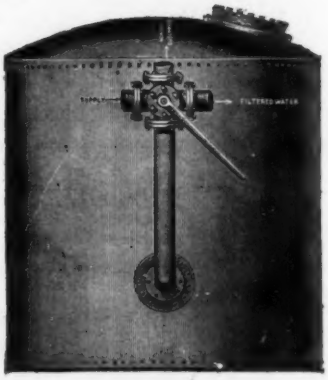

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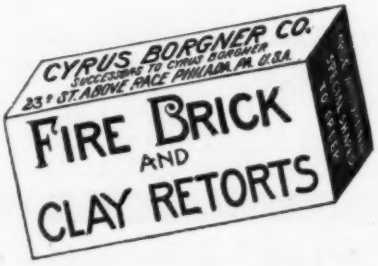

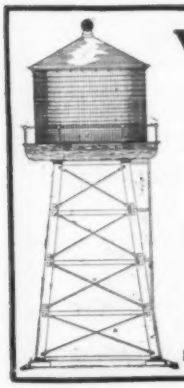

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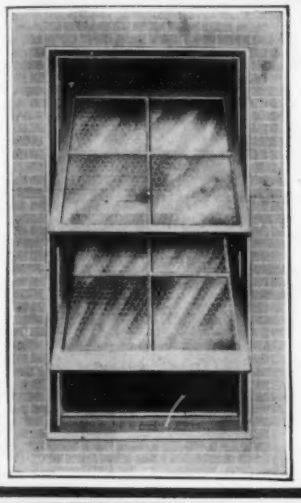

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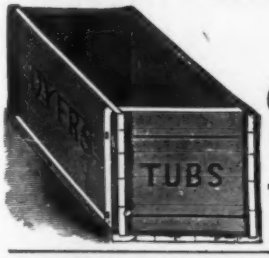

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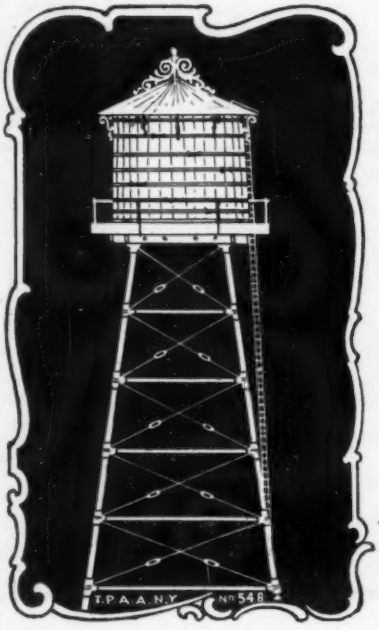

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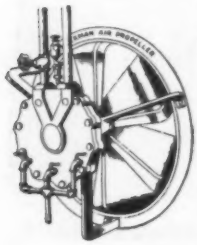

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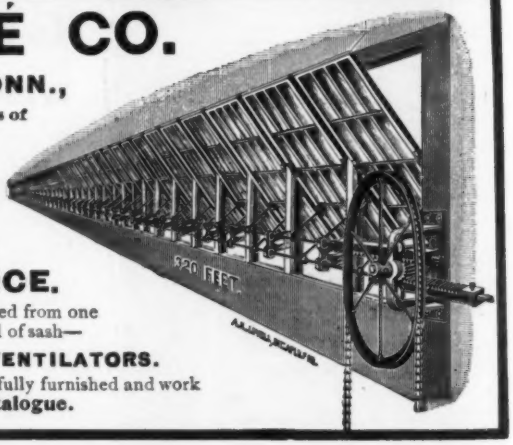

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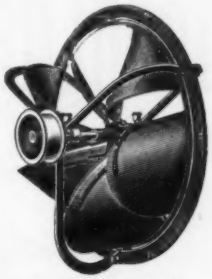

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EFFICIENT
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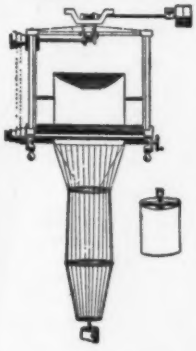

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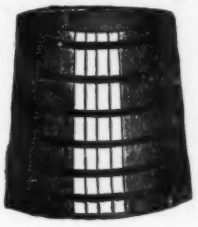

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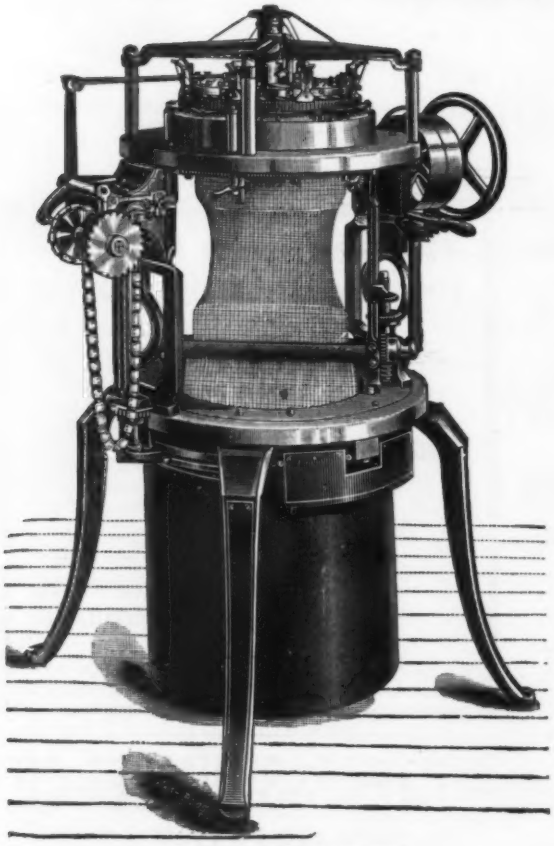
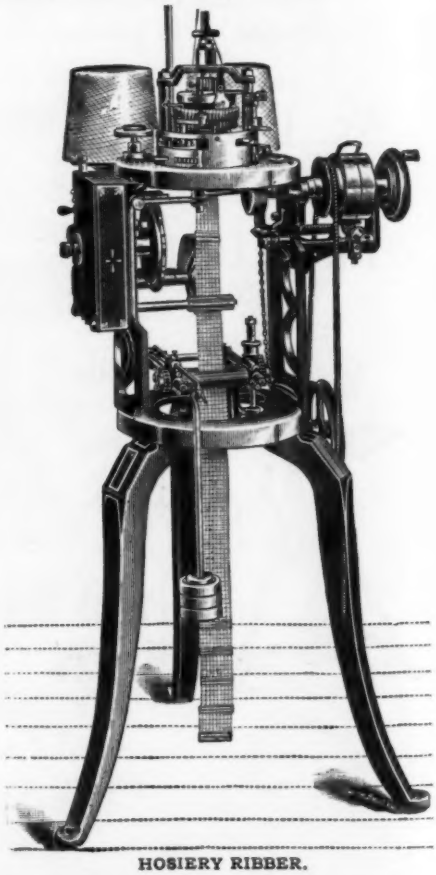
For all classes of Ribbed Hosiery and Underwear, Combination Suits, Sweaters, etc.



AUTOMATIC BODY MACHINE.



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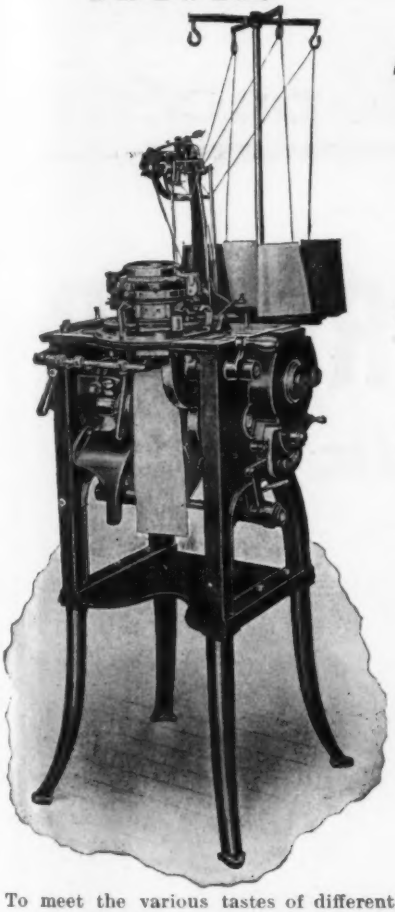

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Two Leaders

Fully Automatic Hosiery Knitters

For Making all Kinds and Gauges of Seamless Hosiery

HEMPHILL

One with

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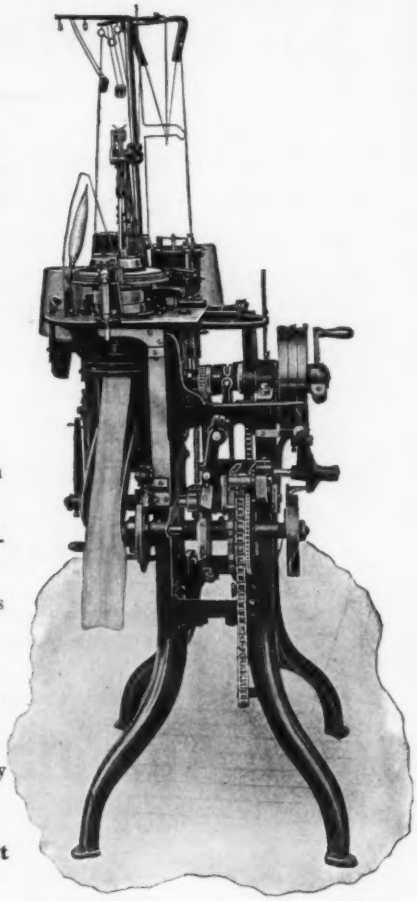
for pattern mechanism



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Both contain all the well-known essentials demanded of first-class knitting machines.

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Many leading manufacturers use our needles and say they are the best on the market.

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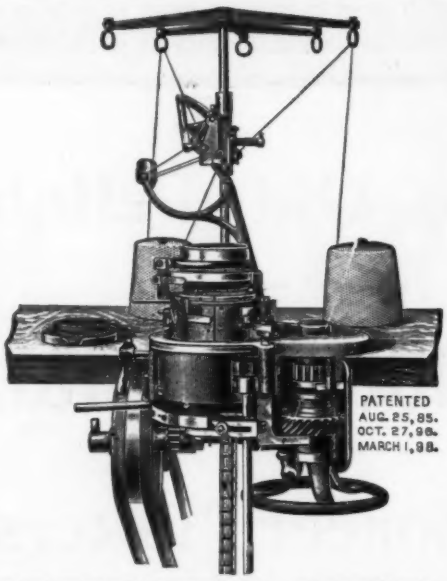

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Leads Them All.

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High Speed Overseaming, Overedging and Scallop Stitch Machines

are LIGHT RUNNING, FAST and DURABLE.

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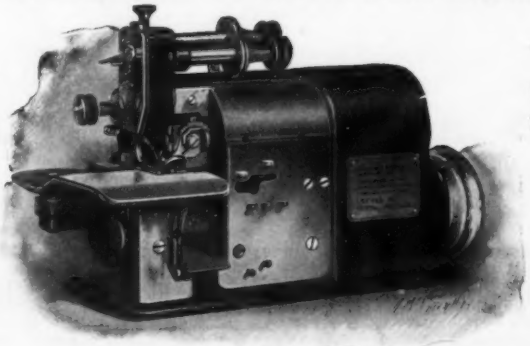
For Necks and Fronts of Rib Goods, produces the most showy, substantial finish.



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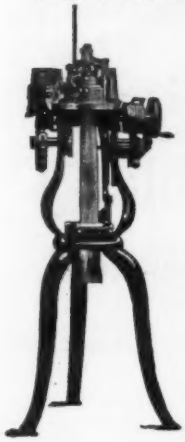

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INCLUDING

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Automatic Welt and Loose Course Machines for Stock Tops. New Circular Stripers with Welt, Loose Course and Striping (Automatic), for Short Cuffs, Sock Tops, Hose Legs, Wristers, etc.

Golf and Bicycle Stocking Machines,

ALL KINDS OF

CIRCULAR RIBBED MACHINES

For Men's Underwear, Ladies' and Misses' Hose Legs and Leggins. **Correspondence Solicited.**

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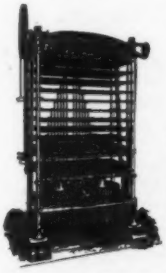

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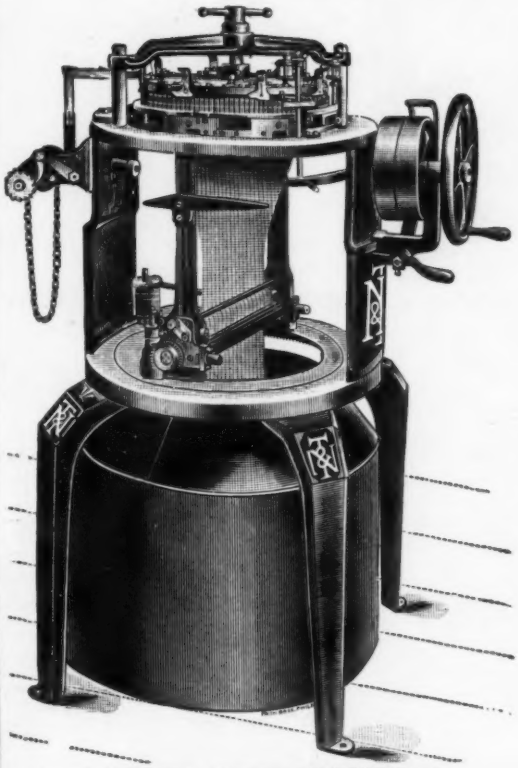
For making Ribbed Underwear, Combination Suits, Sweaters, Cuffs, Shirt Borders, Hosiery, etc. : ; :

Correct Construction. Excellence and Durability.



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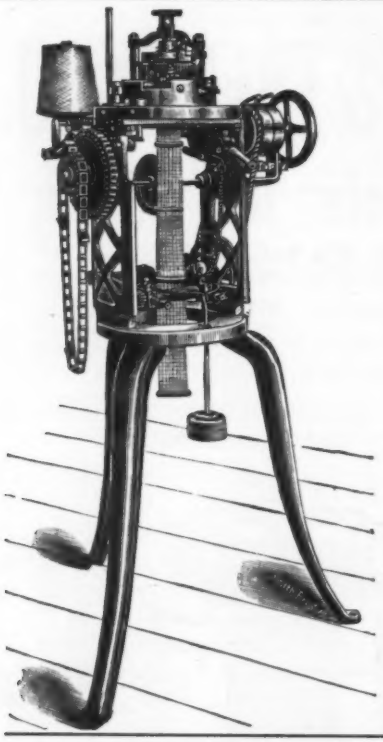

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For HOSIERY and UNDERWEAR.

Complete Estimates Furnished. Send for Particulars.

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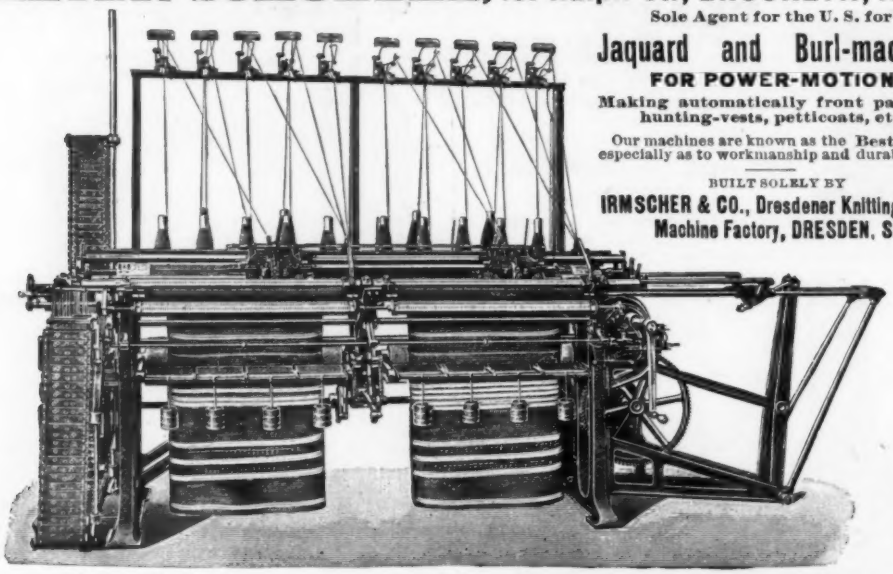
Sole Agent for the U. S. for



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FOR POWER-MOTION

Making automatically front parts of hunting-vests, petticoats, etc.

Our machines are known as the **Best Built** especially as to workmanship and durability.

BUILT SOLELY BY

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SWEATERS.—This machine is built with 1 or two sections which work together (dependently of each-other) and produces all patterns which could be made hitherto on Hand-Jaquard- and Burl-machines automatically in endless pieces with dividing thread. We are ready to wait on with collection of same which will be the best recommendation, and here we will mention but to following advantage of this machine which is constructed very geniously: It is provided with autom., racking-apparatus as far as 6 needles, special cams for double rib, autom. change of all middle and wing-cams, 2 thread-carriers, autom. change of colors, special attachment for locking in the loops and electric stop-motion in case of yarn-breaking, knots, etc.

All these apparatus are set to work by the pattern-chain, consisting of a number of Jaquard-cards. This new arrangement which is our invention enables the knitter to put together any pattern, making the necessary cards by means of a stamp and after a table we subjoin.

Special Hand and Power Machinery for Fancy Gloves, Sweaters, Golf Hose, Ladies' Blouses, Etc.

CIRCULAR KNITTING MACHINES

Either plain or full automatic, with stop motions complete, for

Ribbed Underwear, Sweaters, Cardigans, Cuffs and Anklets.

The Leighton Circular Machines are the only ones which **Rack** or **Shog** the needles for fancy borders; also built for automatic striping; and with from 4 to 16 feeds for underwear.

Also Builders of ABEL WINDERS, SEAMERS and LOOPERS.

LEIGHTON MACHINE CO.,
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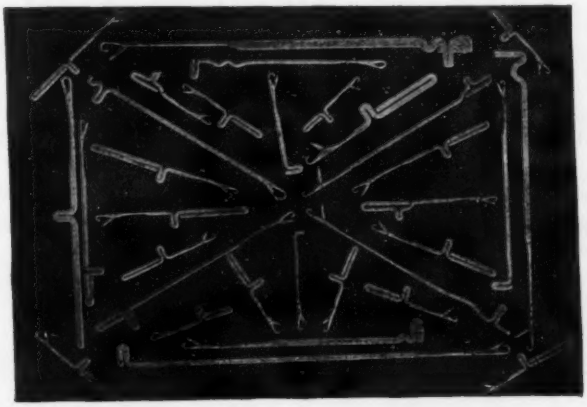
For all Knitting Machines.



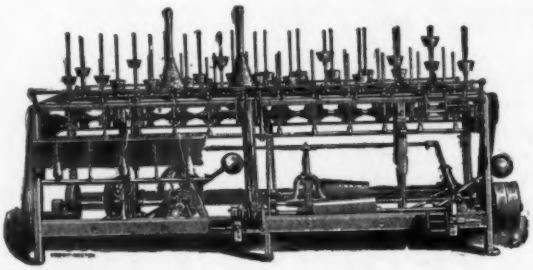
Our Superior or Sunken Rivet Head Needles

Will save you money every day in the year.

Dodge Needle Co., Manchester, N.H.

We now build, with or without differential motion, for winding on Bobbins from Skein or Cop,

THE ABEL WINDERS



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IN CONNECTION WITH OUR LINE OF

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OF ALL KINDS. NEW AND SECOND HAND.

A RARE OPPORTUNITY TO BUY.

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26 Standard B. machines, 200 needles.

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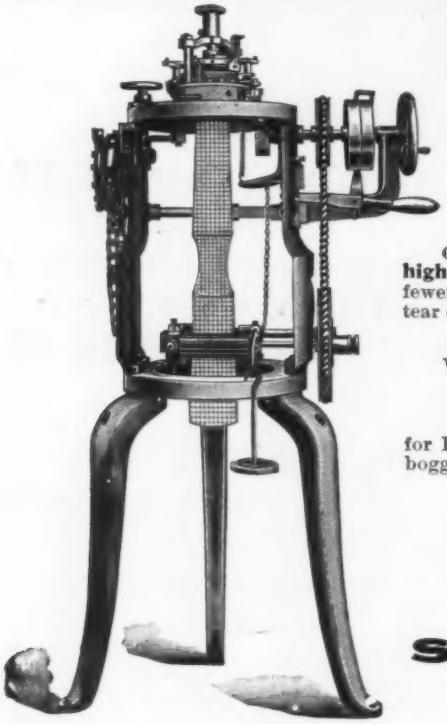

High Speed Rib Knitting Machinery.

Our latest model machinery has been designed to run at **very high speed**, giving large production. This is accomplished with fewer seconds, less breakage of needles, less jar and wear and tear on machines than has been customary at lower speeds.

We also make Special

STRIPING AND DESIGNING MACHINES

for Fancy Golf Stockings, Bathing Suits, Sweaters, Toques, Toboggan Caps, Skirts, etc.

Our Machinery gives large production at low cost and enables manufacturers to meet the market always and make a profit.

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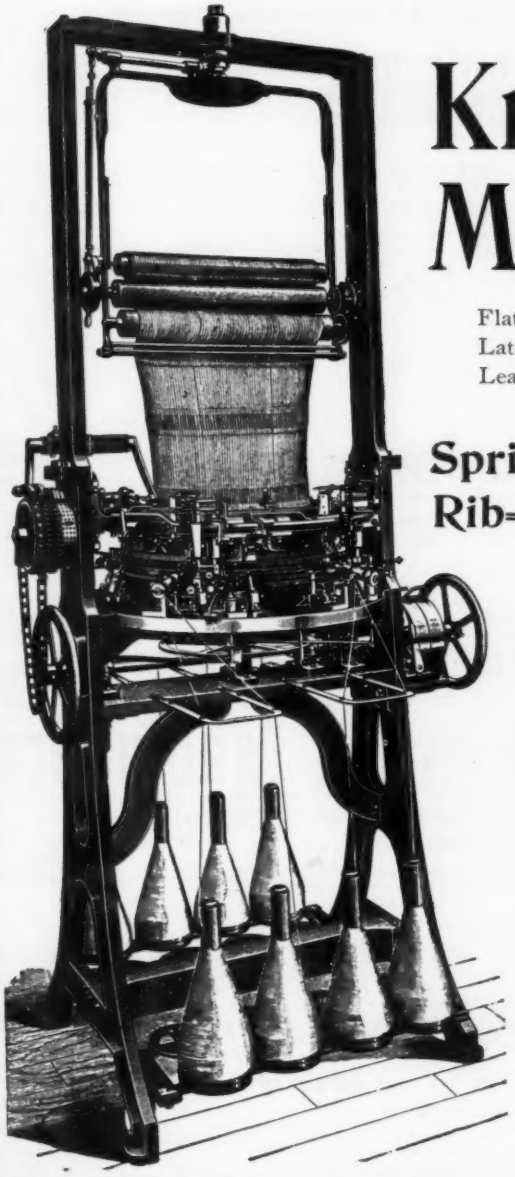

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Flat and Circular Rib, both Spring and Latch Needle, Plain Circular Machines, Lead or Trick Cylinder.

Spring Needle Cylinder Rib-Top Machines

For making Cuffs, Drawer Bottoms and Shirt Borders.

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CROCHET MACHINES

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MACHINES

Spring Beard Needle Machine
For SEAMLESS HOSIERY, Plain and Novelties

Automatic Rib Machine
For RIBBED UNDERWEAR. All Styles and Gauges

Over Seam Machine "Champion, Improved"
For Welting Seamless Hosiery. Covering Raw Edges of Rib Fabrics.

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SEND FOR FULL PARTICULARS
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The best equipped shop in the United States for the Manufacture of

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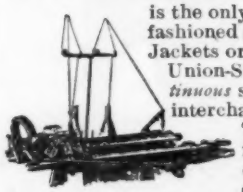
The Grosser PATENT FLAT KNITTING MACHINE



is the only reliable machine for full-fashioned Sweaters, Cardigan or Golf Jackets or Vests, Gloves, Underwear, Union-Suits, etc., that gives *continuous* satisfaction. All parts are interchangeable on our new style. The only automatic Machine for Jacquard Honey-Comb or Seamless Shaker Sweaters. We have the only first class High Speed 2 thread Lockstitch Overseamer for selvedged Knitgoods, that will sew in Sleeves or hem in double Bottoms on Sweaters without puckering. *ARTHUR MUELLER, 780 Madison St , Brooklyn, N. Y. Telephone 665a Bushwick.*

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Hosiery and Laundry Dryers.

Complete Dye Plants Erected.

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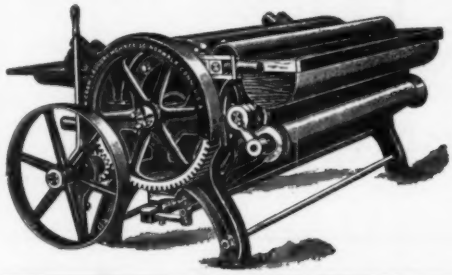
FOR ALL KINDS AND GUAGES OF SEAMLESS HOSIERY.

Has the preference wherever used over 7-8 and full automatics. Because it makes as much or more goods and better goods. Costs less for repairs. Gives less trouble to fixers. Range on Half Hose, from the coarsest to 360 needle.

Exclusive rights to BROWN'S ATTACHMENTS FOR LACE EFFECT.

Cylinders and Dials for all size Machines. **127 Bread Street, Phila.**

AUTOMATIC IRONING and PRESSING MACHINE for KNIT GOODS.



This machine irons and presses ribbed and flat underwear, giving a fine, smooth finish and most attractive appearance to the goods, not to be obtained in any other way. It does not break buttons. Inexpensive and easy to operate, and has large capacity. Knitting mills using them are greatly pleased with results. This method of finishing is sure to come into universal use. Send for further particulars to

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LOOPING MACHINE.

Needle working from the inside, avoiding the breaking of needles and points and picking up the metal.

Single and Double Stitch, or Both Combined.

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PERFECT FAST BLACK FOR HOSIERY AND YARN THAT WILL NOT TENDER THE GOODS.

The Dubois Latest Improved "Sanitary" Oxidize Fast Black Dyeing with Lisle Thread Finish Process, Patented March, 1903, Leads Them All.

This is the most reliable dyeing formula in existence for the dyeing of cotton hosiery. It has been adopted successfully by many of the leading manufacturers, numbering to this date to thirty-four mills. It has the following invaluable quality, viz:

"It always gives uniform shade, oxidizes and lisles quick, and leaves the fabric almost as strong as they were before dyeing, and because of its quick oxidizing and lisleing and not tendering the goods it stops overtime and night work and does away with mending. But most important of all, it is the only dye liquor that can be compounded to suit the seasons of the year and stand the hottest weather of the South without in the least interfering with its good qualities."

The cost of this black is as follows:—$1.50 per 100 pounds for the ordinary black, and $1.90 per 100 pounds for the best, for all chemicals used, labor and steam extra which is very small.

This valuable dye formula with its Lisle Thread Finish Patented process can be bought in a lump sum, or be made use of on paying a small monthly royalty per 100 pounds of goods dyed. The advertiser will go to your mill and personally teach the dyeing, oxidizing, lisleing and finishing, and stay with you until you thoroughly understand all the particulars. Will contract for your complete oxidize dyeing plant with my stationary or rotary oxidizing apparatus with electric thermometer, patented June, 1901 and June, 1902, of which I am the only manufacturer.

NOTICE:—Will be pleased to give highest references on large mills with party meaning business as to above claims.

N. B. I hereby give notice to the general public that I have not and never have had any connection with the O. & P. Rothe Mfg. and Supply Co., Ltd., of Norristown, Pa., and that their advertisement of offering formula for "Sanitary" Fast Black is without my consent.

The "Sanitary" Fast Black Formula is exclusively of my own invention as far back as 18 years, and anyone that buys this valuable formula is always bound to keep it secret, and no one else has the right to use it or sell it.

Apply only to

A. N. DUBOIS, or the KEYSTONE LAW AND PATENT CO.,

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BUILDERS OF

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WITH OR WITHOUT

Transferring Device

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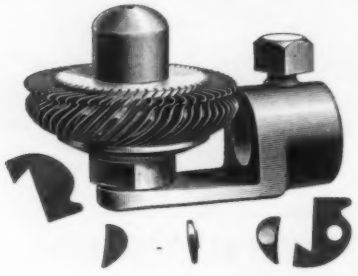

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LACINGS FOR OVERSHIRTS and UNDERWEAR.

Tipped and Tasseled.

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Best Knitting Machines

IMPROVED CONSTRUCTION
FOR HAND AND POWER DRIVING.

High Speed, Excellent Workmanship.

Auto. Rib-top, Fancy-stitch Jacquard Machines.

Everywhere in work. **80,000** Machines sold.

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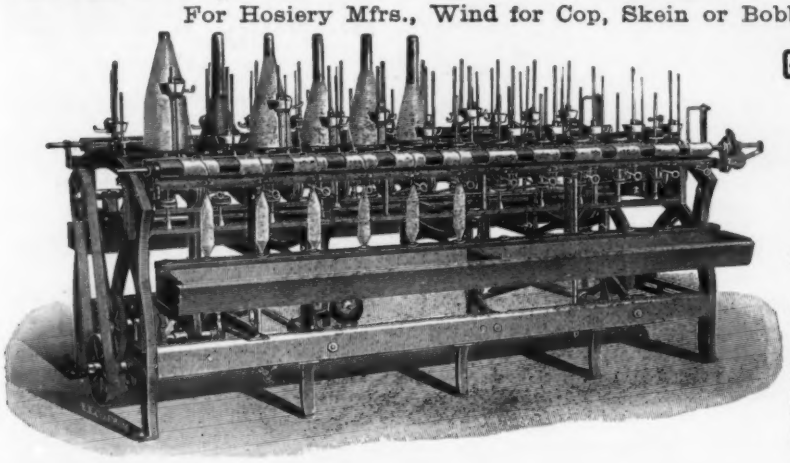
OVER 1,650 PAYNE WINDERS IN USE

For Hosiery Mfrs., Wind for Cop, Skein or Bobbin.



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Builders of the

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Upright Spoolers,

To Spool from Cop, Skein or Bobbin.

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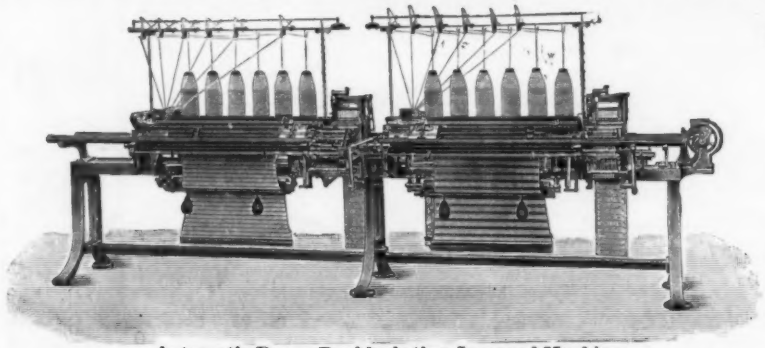

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Automatic Power Double Action Jacquard Machine.

For the production of raised work and colored figures, dots, etc. These machines are built with one or two heads, which are entirely independent from another; for making vests, sweaters, blouses, cardigan jacket fronts, gloves, and all kinds of fancy goods. The number of designs which can be made on this machine is practically unlimited; it is fitted with a double automatic carrier for striped or plated work, one automatic carrier for the separating thread, four self acting locks for 1 and 1 rib, and cardigan stitch, two Jacquard rollers, one of which can be automatically moved from 1-10 needles, automatic rack over 1-4 needles, dropping arrangement for making armholes, automatic stop motion and take-up, also brushes. The construction of the Jacquard mechanism is on the principle of a weaving loom, allowing patterns to be easily and cheaply made, and quickly exchanged.

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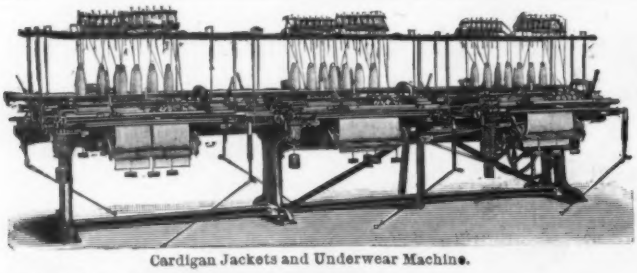

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For Plain and Fancy Goods.

THE BEST IN THE MARKET!

Special Constructions for different articles!

INDEPENDENT HEADS.

DOUBLE SYSTEM OF LOCKS.

Double-side Power Stands, 6 at once.

Paris, 1900, Gold Medal.

Ask for samples and particulars, state guage and size you want.

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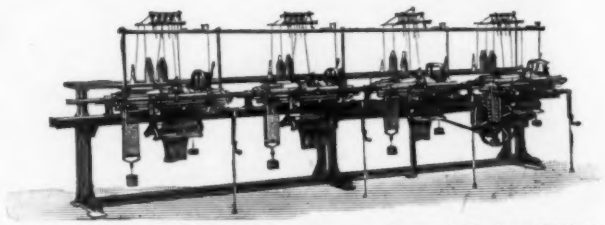
Representatives: Ainslie Knitting Machine Co., Ainslie & Humboldt Sts., Brooklyn, N. Y., where all kinds of hand and power machines can be seen working.



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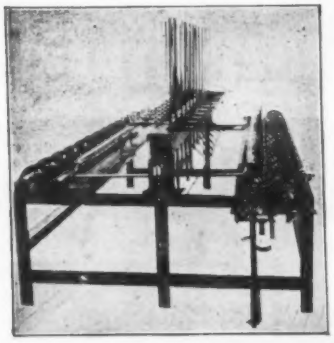

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Lindley's New Automatic Power Glove Fingering Machine, Cardigan Jacket and Circular Knitting Machines for Shirts and Hosiery.

Germantown Skein Winder and Links for Double Ribs

Cylinders and Dials of all kinds made and hardened. Special Machine and Jobbing Work promptly attended to. Also equipped to do general repairing of Platt's Cotton Spinning Machinery. Correspondence solicited.

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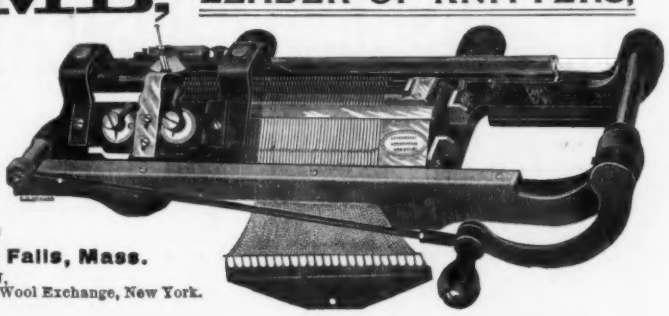

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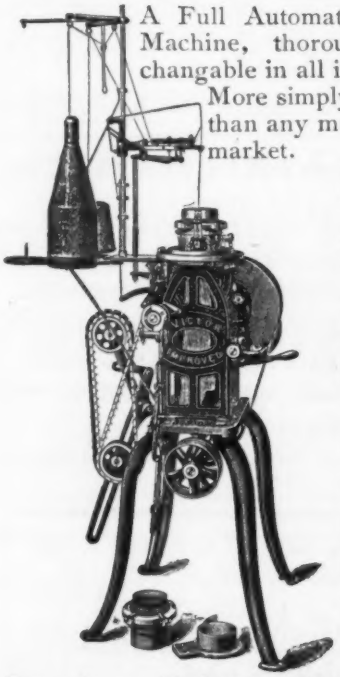
The "New" Victor Knitting Machine



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More simply constructed than any machine on the market.

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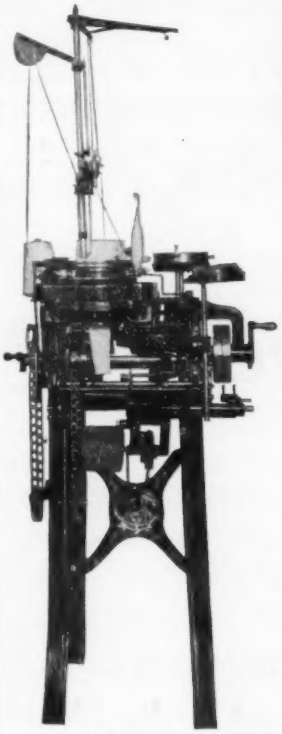
TO BUILD HOSIERY MACHINERY

That's Why There Are More Standards



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Have you seen the new Standard F?

It will produce from **30%** to **50%** more goods than any other machine on the market.

Hosiery manufacturers are invited to inspect it in our show rooms.

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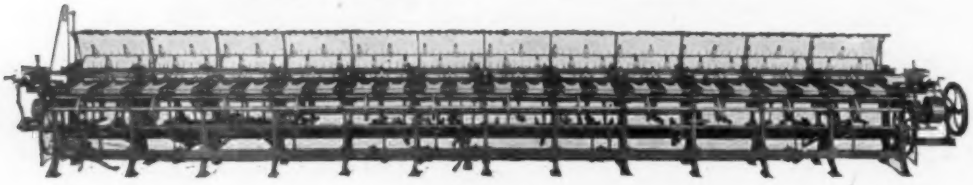

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All Work Guaranteed. MANCHESTER GREEN, CONN.

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PAGE NEEDLE CO.,
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of all kinds. Warranted in every respect.
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A FAN SYSTEM OF HEATING AND VENTILATION IS FAR
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For Ladies', Gents', and Children's Goods.
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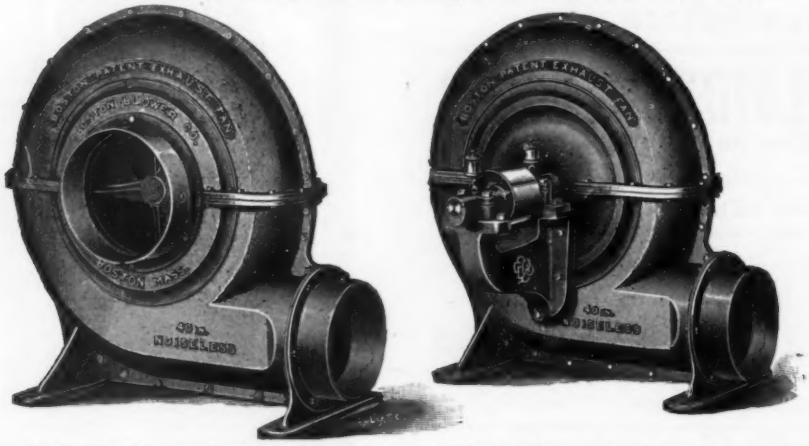
Boston Wool Exhausters, with Removable Tops.

As used in Connection with Pneumatic Conveyer System for Handling Wool, Cotton, Rags, Excelsior, Jute, etc.



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This machine is similar in design to the regular Boston Patent Exhaust Fan, but is fitted with a special wheel for handling fibrous materials, and the top is removable.

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For the handling of wool and cotton stock, rags, excelsior, jute and all kinds of fibrous material, wet or dry. Also spool elevators, steam heating and ventilating, and mill work generally. Blower and fan work a specialty. This conveyor is patented. Beware of infringement.

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We Guarantee Satisfaction.

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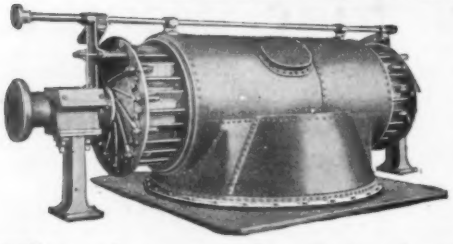

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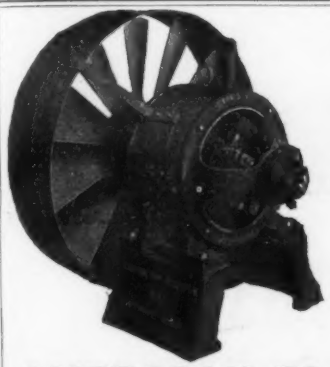

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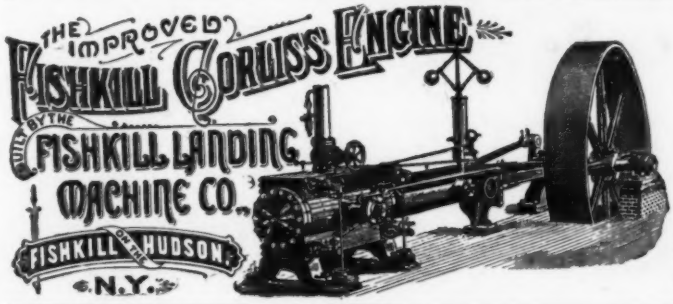
For ventilating, cooling, removal of steam, etc. Low prices. Quick delivery.

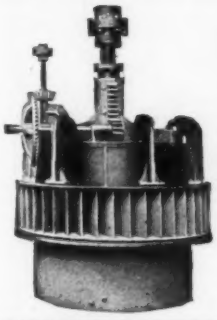
AMERICAN BLOWER COMPANY, Detroit, Mich.

NEW YORK CHICAGO LONDON



Most Efficient and Economical Power in the world For Textile Mills.

It has NO EQUAL for Close Regulation and Noiseless Operation. Send for Catalogue.



Risdon-Alcott Turbine Co.

MOUNT HOLLY, NEW JERSEY, U. S. A.

RISDON CELEBRATED TURBINE
ALCOTT HIGH DUTY TURBINE

On Horizontal or Vertical Shafts.

These Turbines are recognized as the most effective water wheels made. Your inquiries should come direct to us for this class of machinery.

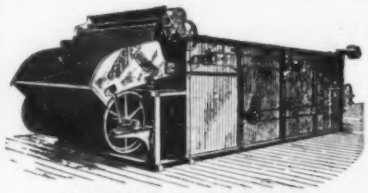
PAIR McCORMICK TURBINES

4,000 H.P., 72 ft. head, arranged to drive generator and a single turbine to drive exciter. Five settings built for the Hudson River Water Power Company's Spier Falls plant and 14 pairs 51 inch for their plant at Mechanicsville, N, Y.

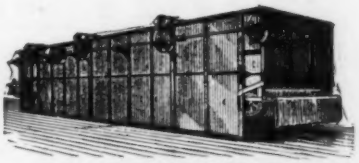
Write for Catalogue if contemplating purchase of turbines.

S. MORGAN SMITH CO.
YORK, PA.
Boston Office, 176 Federal Street.

JUL 14 1904



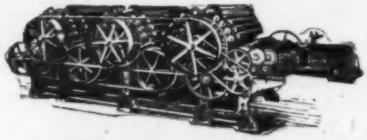
Automatic Cotton Stock Dryer.



Automatic Yarn Dryer.

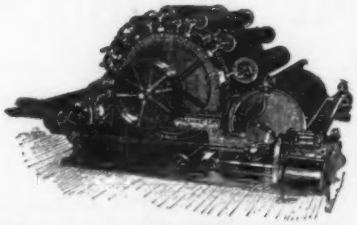
"CYCLONE" DRYERS

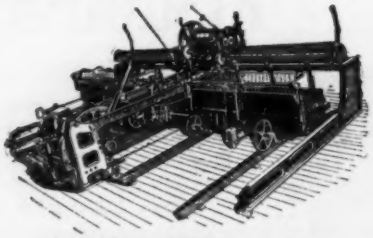
For Cotton Stock, Wool Stock, Rags,
Yarn, Cloth, Underwear, Stockings, Etc.



"PROCTOR"
Garnett Machines and Pickers

For reducing to fibre Cotton and Woolen
Waste, Cloth Clippings, Etc.



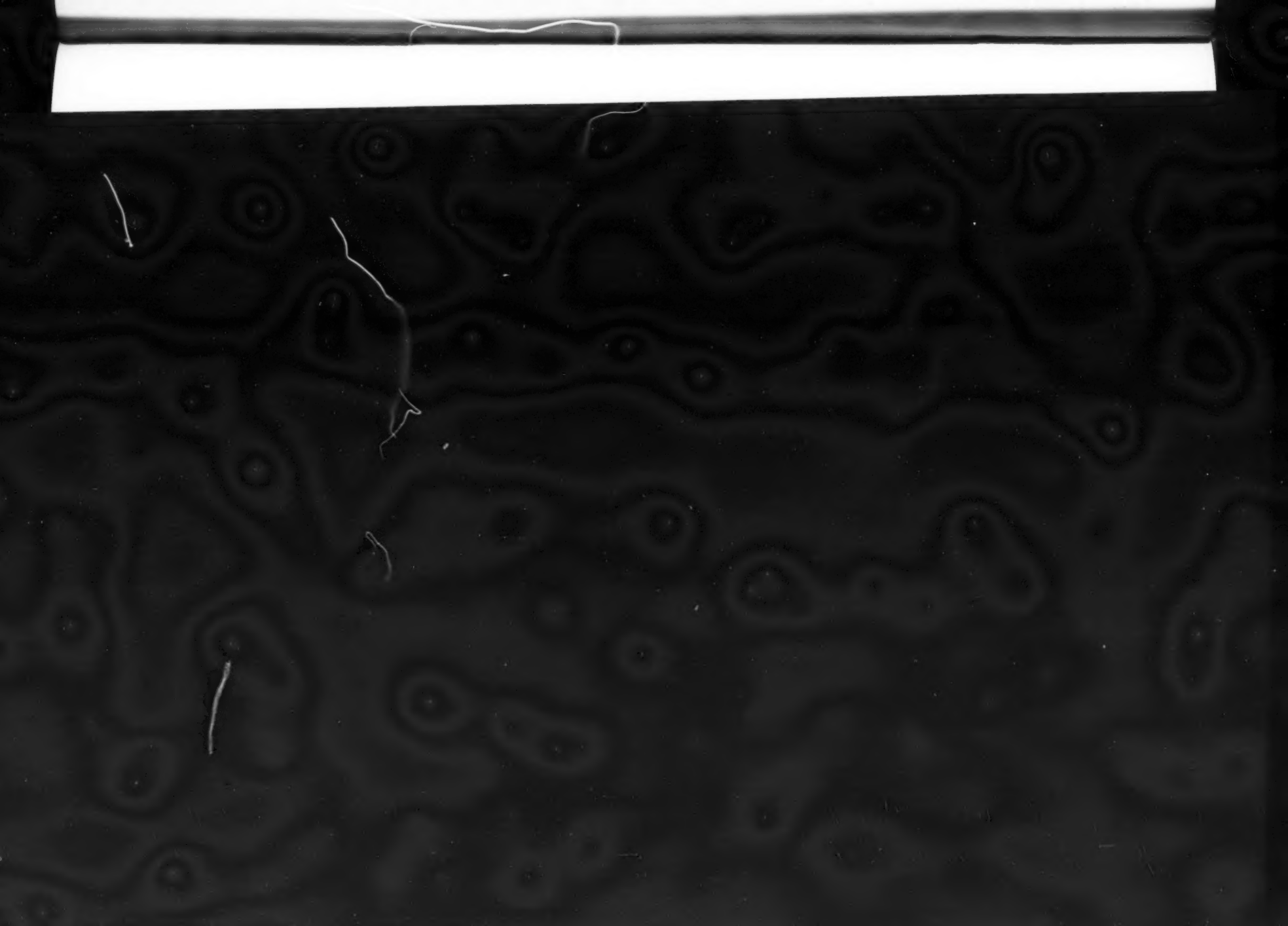


"FURBUSH" Woolen Mill Machinery

Including Pickers, Cards, Mules, Twisters,
Warpers, Dressers, Spoolers, Etc.

Manufactured by

THE PHILADELPHIA TEXTILE MACHINERY CO.,
Hancock and Somerset Sts., - PHILADELPHIA, PA.



Talks to Textile Manufacturers

CHAPTER V

ONE MAN WOKE UP to the fact that he must advertise.

His success makes an interesting story.

This manufacturer knew his textile was the best made for the purpose intended. But it was hard work to sell even a sample piece. The output piled up on him. How was he to get it off his hands?

HE ASKED US to tell him what to do.

WE TOLD HIM to interest the consumer.

We made sure his goods were good. Then we showed him how adequate space in THE BUTTERICK TRIO—read every month by seven and a half million women all over the country—would bring definite results. We showed him how to force the dealer with the results of his advertising to women. We gave him the result of the results of our hundreds of successful advertisers. We knew just what to do—from experience.

Now listen:

Soon over-sold 2,000 pieces. Output increased sevenfold, where before couldn't sell his output. Old accounts revived, small ones enlarged and hundreds of new ones opened. One salesman sold ninety-five out of ninety-six called on.

All this was in "bad times" for his trade, and

NOW HE'S WIDE AWAKE and means to stay so.

The **Old Way** was fire-away-hit-or-miss. The **New Way** is bull's-eye target firing. Our way is the new way. Ask us to show you how to interest women in ***your*** trade-marked textile and how to force dealers to sell, not another, but ***your*** line of goods.

Ask for the complete story of the advertising success outlined above

THOMAS BALMER, Advertising Manager

THE BUTTERICK TRIO

THE DELINEATOR—THE DESIGNER—NEW IDEA WOMAN'S MAGAZINE

Butterick Building, New York

JAMES SMITH WOOLEN MACHINERY CO.

411 to 421 Race Street, Philadelphia.

Woolen Machinery

FOR

Carding, Spinning, Wool Washing, Carnetting, Pickering, Drying, Burring, Cleaning, Finishing.

Cotton Batting and Waste Machinery.

FOR MORE COMPLETE LINE SEE PAGE 59.

BUFFALO DISK WHEELS

For Cooling, Ventilating, Drying.

Types: PULLEY, STEAM, ELECTRIC.

For Removing Steam from Slashers and Dye-Houses as well as all offensive odors common to dyeing processes. They are largely and successfully employed in cotton, linen and woolen mills for such purposes as well as for preventing harmful condensation of steam in the room.

BUFFALO FORGE COMPANY, Buffalo, N. Y.

NEW FOSTER CONE.

Open wind from start to finish of Cone.

No press-offs from knots, over-winds, etc.

The only perfect system of winding yarn for knitting purposes.

Over 30,000 spindles in use in the U. S.

FOSTER MACHINE CO.,

Westfield, Mass.

Walworth Manufacturing Co.,

HIGH PRESSURE

VALVES AND FITTINGS

"Walmanco" Pipe Flanges,

"Never Stick" Blow-off Cocks, Mill Supplies.

GENERAL OFFICES:

132 FEDERAL STREET, BOSTON, MASS.

New York Office: Park Row Building.